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915156

REMEDIAL INVESTIGATION REPORT

VOLUME II - Appendices

Leica Inc.
Cheektowaga, New York
Site Code: 915156

PRINTED ON

OCT 3 1994

REMEDIAL INVESTIGATION REPORT

VOLUME II - Appendices

Leica Inc.
Cheektowaga, New York
Site Code: 915156

OCTOBER 1994
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CONESTOGA-ROVERS & ASSOCIATES

APPENDIX A

HISTORICAL ANALYTICAL DATABASE

TABLE A.1
OFF-SITE SURFACE SAMPLES
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
LEICA INC.
CHEEKTOWAGA, NEW YORK

Parameter	*Sample:*	*SW11193K*	*SED11193*
	Sample Date:	*11/10/93*	*11/10/93*
	Units:	*ug/L*	*ug/kg*
Volatiles			
Chloromethane		ND (10)	ND (31)
Bromoethane		ND (10)	ND (31)
Vinyl chloride		ND (10)	ND (31)
Chloroethane		ND (10)	ND (31)
Methylene chloride		ND (10)	ND (31)
Acetone		5J	ND (31)
Carbon disulfide		ND (10)	ND (31)
1,1-Dichloroethene		ND (10)	ND (31)
1,1-Dichloroethane		ND (10)	ND (31)
1,2-Dichloroethene (total)		ND (10)	ND (31)
Chloroform		ND (10)	ND (31)
1,2-Dichloroethane		ND (10)	ND (31)
2-Butanone		ND (10)	ND (31)
1,1,1-Trichloroethane		ND (10)	ND (31)
Carbon tetrachloride		ND (10)	ND (31)
Bromodichloromethane		ND (10)	ND (31)
1,2-Dichloropropane		ND (10)	ND (31)
cis-1,3-Dichloropropene		ND (10)	ND (31)
Trichloroethene		ND (10)	8J
Dibromochloromethane		ND (10)	ND (31)
1,1,2-Trichloroethane		ND (10)	ND (31)
Benzene		ND (10)	ND (31)
trans-1,3-Dichloropropene		ND (10)	ND (31)
Bromoform		ND (10)	ND (31)
4-Methyl-2-pentanone		ND (10)	ND (31)
2-Hexanone		ND (10)	ND (31)
Tetrachloroethene		ND (10)	ND (31)
1,1,2,2-Tetrachloroethane		ND (10)	ND (31)
Toluene		ND (10)	ND (31)
Chlorobenzene		ND (10)	ND (31)
Ethylbenzene		ND (10)	ND (31)
Styrene		ND (10)	ND (31)
Xylene (total)		ND (10)	ND (31)
1,1,2-Trichlorotrifluoroethane		ND (10)	ND (31)

TABLE A.1
OFF-SITE SURFACE SAMPLES
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
LEICA INC.
CHEEKTOWAGA, NEW YORK

Parameter	*Sample:*	*SW11193K*	*SED11193*
	Sample Date:	*11/10/93*	*11/10/93*
	Units:	*ug/L*	*ug/kg*
Semi-Volatiles			
Phenol		ND (10)	ND (1,100)J
bis(2-Chloroethyl)ether		ND (10)	ND (1,100)
2-Chlorophenol		ND (10)	ND (1,100)J
1,3-Dichlorobenzene		ND (10)	ND (1,100)
1,4-Dichlorobenzene		ND (10)	ND (1,100)
1,2-Dichlorobenzene		ND (10)	ND (1,100)
2-Methylphenol		ND (10)	ND (1,100)
2,2'-oxybis(1-Chloropropane)		ND (10)	ND (1,100)
4-Methylphenol		ND (10)	ND (1,100)
N-Nitroso-di-n-propylamine		ND (10)	ND (1,100)J
Hexachloroethane		ND (10)	ND (1,100)
Nitrobenzene		ND (10)	ND (1,100)
Isophorone		ND (10)	ND (1,100)
2-Nitrophenol		ND (10)	ND (1,100)
2,4-Dimethylphenol		ND (10)	ND (1,100)
bis(2-Chloroethoxy)methane		ND (10)	ND (1,100)
2,4-Dichlorophenol		ND (10)	ND (1,100)
1,2,4-Trichlorobenzene		ND (10)	ND (1,100)
Naphthalene		ND (10)	2,700
4-Chloroaniline		ND (10)	ND (1,100)
Hexachlorobutadiene		ND (10)	ND (1,100)
4-Chloro-3-methylphenol		ND (10)	ND (1,100)J
2-Methylnaphthalene		ND (10)	3,500
Hexachlorocyclopentadiene		ND (10)	ND (1,100)
2,4,6-Trichlorophenol		ND (10)	ND (1,100)
2,4,5-Trichlorophenol		ND (25)	ND (2,700)
2-Chloronaphthalene		ND (10)	ND (1,100)
2-Nitroaniline		ND (25)	ND (2,700)
Dimethylphthalate		ND (10)	ND (1,100)
Acenaphthylene		ND (10)	330J
2,6-Dinitrotoluene		ND (10)	ND (1,100)
3-Nitroaniline		ND (25)	ND (2,700)
Acenaphthene		ND (10)	560J
2,4-Dinitrophenol		ND (25)	ND (2,700)
4-Nitrophenol		ND (25)	ND (2,700)

TABLE A.1
OFF-SITE SURFACE SAMPLES
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
LEICA INC.
CHEEKTOWAGA, NEW YORK

Parameter	*Sample:*	*SW11193K*	*SED11193*
	Sample Date:	*11/10/93*	*11/10/93*
	Units:	*ug/L*	*ug/kg*
Semi-Volatiles (cont.)			
Dibenzofuran		ND (10)	1,200
2,4-Dinitrotoluene		ND (10)	ND (1,100)
Diethylphthalate		ND (10)	ND (1,100)
4-Chlorophenyl-phenylether		ND (10)	ND (1,100)
Fluorene		ND (10)	660J
4-Nitroaniline		ND (25)	ND (2,700)
4,6-Dinitro-2-methylphenol		ND (25)	ND (2,700)
N-Nitrosodiphenylamine		ND (10)	ND (1,100)
4-Bromophenyl-phenylether		ND (10)	ND (1,100)
Hexachlorobenzene		ND (10)	ND (1,100)
Pentachlorophenol		ND (25)	ND (2,700)
Phenanthrene		ND (10)	13,000D
Anthracene		ND (10)	1,500
Carbazole		ND (10)	5,200J
Di-n-butylphthalate		ND (10)	320J
Fluoranthene		ND (10)	25,000D
Pyrene		ND (10)	18,000D
Butylbenzylphthalate		ND (10)	600J
3,3'-Dichlorobenzidine		ND (10)	ND (1,100)
Benzo(a)anthracene		ND (10)	8,400JD
Chrysene		ND (10)	8,100
bis(2-Ethylhexyl)phthalate		1J	7,700U
Di-n-octylphthalate		ND (10)	ND (1,100)
Benzo(b)fluoranthene		ND (10)	24,000D
Benzo(k)fluoranthene		ND (10)	11,000UD
Benzo(a)pyrene		ND (10)	12,000D
Ideno(1,2,3-cd)pyrene		ND (10)	4,700
Dibenz(a,h)anthracene		ND (10)	2,100
Benzo(g,h,i)perylene		ND (10)	4,400

TABLE A.1
OFF-SITE SURFACE SAMPLES
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
LEICA INC.
CHEEKTOWAGA, NEW YORK

Parameter	***Sample:***	***SW11193K***	***SED11193***
	Sample Date:	***11/10/93***	***11/10/93***
	Units:	***ug/L***	***ug/kg***
Metals			
Aluminum		611	11,000
Antimony		ND (8.2)	18.5UJ
Arsenic		18.5	109
Barium		233	832
Beryllium		ND (0.30)	1.0
Cadmium		6.8	9.8
Calcium		70,700	14,700
Chromium		ND (8.3)	99
Cobalt		ND (2.6)	14.7
Copper		27	280
Iron		899	26,700
Lead		56.2J	1,830
Magnesium		7,970	3,160
Manganese		344	838
Mercury		ND (0.10)	1.1
Nickel		ND (20.5)	102
Potassium		3,190	1,850
Selenium		ND (1.0)J	2.0
Silver		ND (1.8)	ND (0.53)
Sodium		31,100	241
Thallium		ND (1.3)	ND (0.39)
Vanadium		ND (2.0)	65.7
Zinc		208	1,500
Wet Chemistry			
Total Petroleum Hydrocarbons		ND (2.5)	ND (94)

Notes:

D	Value quantitated from a dilution.
J	Associated value is estimated.
U	Non-detect at the associated value.

TABLE A.2
SOIL SAMPLES
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
LEICA INC.
CHEEKTOWAGA, NEW YORK

Parameter	*Sample ID:*	*BH-1-93*	*BH-2-93*	*BH-3-93*	*BH-3C-93*	*BH-4-93*
	Depth:	*0.0-3.0 Ft.*	*0.0-3.0 Ft.*	*1.5-3.0 Ft.*	*1.5-2.5 Ft.*	*0.5-4.0 Ft.*
	Collection date:	*12/03/93*	*12/08/93*	*12/08/93*	*12/13/93*	*12/03/93*
Volatiles (µg/kg)						
Chloromethane		ND (12)	ND (14)	ND (13)	ND (12)	NA
Bromomethane		ND (12)	ND (14)	ND (13)	3J	NA
Vinyl chloride		ND (12)	ND (14)	42	ND (12)	NA
Chloroethane		ND (12)	ND (14)	ND (13)	ND (12)	NA
Methylene chloride		ND (12)	ND (14)	ND (13)	ND (12)	NA
Acetone		10J	2J	49J	45J	NA
Carbon disulfide		ND (12)	ND (14)	2J	ND (12)	NA
1,1-Dichloroethene		ND (12)	ND (14)	ND (13)	ND (12)	NA
1,1-Dichloroethane		ND (12)	ND (14)	ND (13)	ND (12)	NA
1,2-Dichloroethene (total)		55	6J	160D	19	NA
Chloroform		ND (12)	ND (14)	ND (13)	ND (12)	NA
1,2-Dichloroethane		ND (12)	ND (14)	ND (13)	ND (12)	NA
2-Butanone		ND (12)J	ND (14)J	9J	ND (12)J	NA
1,1,1-Trichloroethane		ND (12)	ND (14)	ND (13)	8J	NA
Carbon tetrachloride		ND (12)	ND (14)	ND (13)	ND (12)	NA
Bromodichloromethane		ND (12)	ND (14)	ND (13)	ND (12)	NA
1,2-Dichloropropane		ND (12)	ND (14)	ND (13)	ND (12)	NA
cis-1,3-Dichloropropene		ND (12)	ND (14)	ND (13)	ND (12)	NA
Trichloroethene		150J	5J	ND (13)	8J	NA
Dibromochloromethane		ND (12)	ND (14)	ND (13)	ND (12)	NA
1,1,2-Trichloroethane		ND (12)	ND (14)	ND (13)	ND (12)	NA
Benzene		ND (12)	ND (14)	ND (13)	ND (12)	NA
trans-1,3-Dichloropropene		ND (12)	ND (14)	ND (13)	ND (12)	NA
Bromoform		ND (12)	ND (14)	ND (13)	ND (12)	NA
4-Methyl-2-pentanone		ND (12)	ND (14)	ND (13)	ND (12)	NA
2-Hexanone		ND (12)	ND (14)	6J	ND (12)	NA
Tetrachloroethene		ND (12)	ND (14)	ND (13)	ND (12)	NA
1,1,2,2-Tetrachloroethane		ND (12)J	ND (14)J	ND (13)J	ND (12)	NA
Toluene		ND (12)	ND (14)	39	ND (12)	NA
Chlorobenzene		ND (12)	ND (14)	ND (13)	ND (12)	NA
Ethylbenzene		ND (12)	ND (14)	42	ND (12)	NA
Styrene		ND (12)	ND (14)	ND (13)	ND (12)	NA
Xylene (total)		ND (12)	ND (14)	190D	ND (12)	NA
TCLP Volatiles (µg/L)						
Vinyl chloride		NA	NA	ND (10)J	NA	6J
1,1-Dichloroethene		NA	NA	ND (10)J	NA	ND (10)
Chloroform		NA	NA	ND (10)J	NA	ND (10)
1,2-Dichloroethane		NA	NA	3J	NA	ND (10)
2-Butanone		NA	NA	ND (10)J	NA	ND (10)J
Carbon tetrachloride		NA	NA	ND (10)	NA	ND (10)
Trichloroethene		NA	NA	ND (10)	NA	14
Benzene		NA	NA	ND (10)	NA	ND (10)
Tetrachloroethene		NA	NA	ND (10)J	NA	ND (10)
Chlorobenzene		NA	NA	ND (10)	NA	ND (10)

TABLE A.2
SOIL SAMPLES
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
LEICA INC.
CHEEKTOWAGA, NEW YORK

Parameter	*Sample ID:*	*BH-1-93*	*BH-2-93*	*BH-3-93*	*BH-3C-93*	*BH-4-93*
	Depth:	*0.0-3.0 Ft.*	*0.0-3.0 Ft.*	*1.5-3.0 Ft.*	*1.5-2.5 Ft.*	*0.5-4.0 Ft.*
	Collection date:	*12/03/93*	*12/08/93*	*12/08/93*	*12/13/93*	*12/03/93*
Semi-Volatiles (ug/kg)						
Phenol		ND (390)	NA	ND (440)	NA	NA
bis(2-Chloroethyl)ether		ND (390)	NA	ND (440)	NA	NA
2-Chlorophenol		ND (390)	NA	ND (440)	NA	NA
1,3-Dichlorobenzene		ND (390)	NA	ND (440)	NA	NA
1,4-Dichlorobenzene		ND (390)	NA	ND (440)	NA	NA
1,2-Dichlorobenzene		ND (390)	NA	ND (440)	NA	NA
2-Methylphenol		ND (390)	NA	ND (440)	NA	NA
2,2'-oxybis(1-Chloropropane)		ND (390)	NA	ND (440)	NA	NA
4-Methylphenol		ND (390)J	NA	ND (440)	NA	NA
N-Nitroso-di-n-propylamine		ND (390)	NA	ND (440)	NA	NA
Hexachloroethane		ND (390)	NA	ND (440)	NA	NA
Nitrobenzene		ND (390)	NA	ND (440)	NA	NA
Isophorone		ND (390)	NA	ND (440)	NA	NA
2-Nitrophenol		ND (390)	NA	ND (440)	NA	NA
2,4-Dimethylphenol		ND (390)	NA	ND (440)	NA	NA
bis(2-Chloroethoxy)methane		ND (390)	NA	ND (440)	NA	NA
2,4-Dichlorophenol		ND (390)	NA	ND (440)	NA	NA
1,2,4-Trichlorobenzene		ND (390)	NA	ND (440)	NA	NA
Naphthalene		ND (390)	NA	ND (440)	NA	NA
4-Chloroaniline		ND (390)	NA	ND (440)	NA	NA
Hexachlorobutadiene		ND (390)J	NA	ND (440)	NA	NA
4-Chloro-3-methylphenol		ND (390)	NA	ND (440)	NA	NA
2-Methylnaphthalene		ND (390)	NA	ND (440)	NA	NA
Hexachlorocyclopentadiene		ND (390)J	NA	ND (440)	NA	NA
2,4,6-Trichlorophenol		ND (390)	NA	ND (440)	NA	NA
2,4,5-Trichlorophenol		ND (980)	NA	ND (1,100)	NA	NA
2-Chloronaphthalene		ND (390)	NA	ND (440)	NA	NA
2-Nitroaniline		ND (980)	NA	ND (1,100)	NA	NA
Dimethylphthalate		ND (390)	NA	ND (440)	NA	NA
Acenaphthylene		ND (390)	NA	ND (440)	NA	NA
2,6-Dinitrotoluene		ND (390)	NA	ND (440)	NA	NA
3-Nitroaniline		ND (980)	NA	ND (1,100)	NA	NA
Acenaphthene		ND (390)	NA	ND (440)	NA	NA
2,4-Dinitrophenol		ND (980)	NA	ND (1,100)J	NA	NA
4-Nitrophenol		ND (980)	NA	ND (1,100)	NA	NA
Dibenzofuran		ND (390)	NA	ND (440)	NA	NA
2,4-Dinitrotoluene		ND (390)	NA	ND (440)	NA	NA
Diethylphthalate		ND (390)	NA	ND (440)	NA	NA

TABLE A.2
SOIL SAMPLES
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
LEICA INC.
CHEEKTOWAGA, NEW YORK

Parameter	*Sample ID:*	*BH-1-93*	*BH-2-93*	*BH-3-93*	*BH-3C-93*	*BH-4-93*
	Depth:	*0.0-3.0 Ft.*	*0.0-3.0 Ft.*	*1.5-3.0 Ft.*	*1.5-2.5 Ft.*	*0.5-4.0 Ft.*
	Collection date:	*12/03/93*	*12/08/93*	*12/08/93*	*12/13/93*	*12/03/93*
Semi-Volatiles (ug/kg) Cont'd.						
4-Chlorophenyl-phenylether		ND (390)	NA	ND (440)	NA	NA
Fluorene		ND (390)	NA	ND (440)	NA	NA
4-Nitroaniline		ND (980)	NA	ND (1,100)J	NA	NA
4,6-Dinitro-2-methylphenol		ND (980)	NA	ND (1,100)	NA	NA
N-Nitrosodiphenylamine(1)		ND (390)J	NA	ND (440)	NA	NA
4-Bromophenyl-phenylether		ND (390)	NA	ND (440)	NA	NA
Hexachlorobenzene		ND (390)	NA	ND (440)	NA	NA
Pentachlorophenol		ND (980)	NA	ND (1,100)	NA	NA
Phenanthrene		ND (390)	NA	ND (440)	NA	NA
Anthracene		ND (390)	NA	ND (440)	NA	NA
Carbazole		ND (390)	NA	ND (440)J	NA	NA
Di-n-butylphthalate		ND (390)	NA	ND (440)	NA	NA
Fluoranthene		100J	NA	130J	NA	NA
Pyrene		66J	NA	150J	NA	NA
Butylbenzylphthalate		ND (390)	NA	ND (440)	NA	NA
3,3'-Dichlorobenzidine		ND (390)	NA	ND (440)	NA	NA
Benzo(a)anthracene		ND (390)	NA	ND (440)	NA	NA
Chrysene		ND (390)	NA	ND (440)	NA	NA
bis(2-Ethylhexyl)phthalate		ND (660)	NA	ND (440)	NA	NA
Di-n-octylphthalate		ND (390)J	NA	ND (440)J	NA	NA
Benzo(b)fluoranthene		ND (390)	NA	ND (440)J	NA	NA
Benzo(k)fluoranthene		ND (390)	NA	ND (440)	NA	NA
Benzo(a)pyrene		ND (390)	NA	ND (440)	NA	NA
Ideno(1,2,3-cd)pyrene		ND (390)	NA	ND (440)	NA	NA
Dibenz(a,h)anthracene		ND (390)	NA	ND (440)	NA	NA
Benzo(g,h,i)perylene		ND (390)	NA	ND (440)	NA	NA
Petroleum Products (mg/kg)						
Gasoline		NA	NA	Not Present J	NA	Not Present
Kerosene		NA	NA	ND (33)J	NA	ND (1,300)
Fuel oil		NA	NA	180J	NA	55,000
Lubricating oil		NA	NA	Present	NA	Not Present

TABLE A.2
SOIL SAMPLES
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
LEICA INC.
CHEEKTOWAGA, NEW YORK

Parameter	*Sample ID:*	*BH-1-93*	*BH-2-93*	*BH-3-93*	*BH-3C-93*	*BH-4-93*
	Depth:	*0.0-3.0 Ft.*	*0.0-3.0 Ft.*	*1.5-3.0 Ft.*	*1.5-2.5 Ft.*	*0.5-4.0 Ft.*
	Collection date:	*12/03/93*	*12/08/93*	*12/08/93*	*12/13/93*	*12/03/93*
TCLP Semi-Volatiles (µg/L)						
1,4-Dichlorobenzene		NA	NA	ND (11)J	NA	ND (10)
2-Methylphenol		NA	NA	ND (11)J	NA	1J
Hexachloroethane		NA	NA	ND (11)J	NA	ND (10)
Nitrobenzene		NA	NA	ND (11)J	NA	ND (10)
Hexachlorobutadiene		NA	NA	ND (11)J	NA	ND (10)
2,4,6-Trichlorophenol		NA	NA	ND (11)J	NA	ND (10)
2,4,5-Trichlorophenol		NA	NA	ND (26)J	NA	ND (26)
2,4-Dinitrotoluene		NA	NA	ND (11)J	NA	ND (10)
Hexachlorobenzene		NA	NA	ND (11)J	NA	ND (10)
Pentachlorophenol		NA	NA	ND (26)J	NA	ND (26)
Pyridine		NA	NA	ND (11)J	NA	ND (10)J
3/4-Methylphenol		NA	NA	ND (11)J	NA	1J
3-Methylphenol		-	NA	-	-	-
4-Methylphenol		-	NA	-	-	-
Metals (mg/kg)						
Aluminum		12,800	18,100	29,600	17,000	NA
Antimony		ND (1.9)J	ND (2.3)	ND (2.2)	ND (4.3)	NA
Arsenic		8.0	8.3	0.88	6.1	NA
Barium		92.4	137	235	233	NA
Beryllium		ND (0.47)	ND (0.85)	ND (1.0)	0.88	NA
Cadmium		ND (1.4)	2.0	ND (1.3)	ND (0.78)	NA
Calcium		57,400	11,900	3,730	3,660	NA
Chromium		18.8	26.6	30.0	23.1	NA
Cobalt		12.5	12.5	8.3	13.1	NA
Copper		24.4J	26.1	9.7	21.3	NA
Iron		19,600	32,000	20,000	31,900	NA
Lead		60.0J	20.3	13.9	16.3	NA
Magnesium		19,400	8,730	5,690	5,650	NA
Manganese		475	408	182	999	NA
Mercury		ND (0.050)	ND (0.11)	ND (0.17)	ND (0.060)	NA
Nickel		21.8	29.6	31.0	33.0	NA
Potassium		2,140	2,720	2,620	1,980	NA
Selenium		ND (0.24)J	ND (0.28)J	ND (0.27)	ND (0.38)	NA
Silver		ND (0.42)J	ND (0.51)	ND (0.48)	ND (0.73)	NA
Sodium		362J	ND (219)	347	ND (159)	NA
Thallium		ND (0.31)	0.62	ND (0.77)	ND (0.31)	NA
Vanadium		25.0	41.3	27.3	31.7	NA
Zinc		74.6J	89.6	159	102	NA

TABLE A.2
SOIL SAMPLES
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
LEICA INC.
CHEEKTOWAGA, NEW YORK

Parameter	*Sample ID:*	*BH-1-93*	*BH-2-93*	*BH-3-93*	*BH-3C-93*	*BH-4-93*
	Depth:	*0.0-3.0 Ft.*	*0.0-3.0 Ft.*	*1.5-3.0 Ft.*	*1.5-2.5 Ft.*	*0.5-4.0 Ft.*
	Collection date:	*12/03/93*	*12/08/93*	*12/08/93*	*12/13/93*	*12/03/93*
TCLP Metals (µg/L)						
Arsenic		NA	NA	ND (41.5)	NA	ND (41.5)
Barium		NA	NA	1,830	NA	4,660
Cadmium		NA	NA	ND (3.3)	NA	ND (3.3)
Chromium		NA	NA	ND (8.9)	NA	ND (8.9)
Lead		NA	NA	ND (17.5)	NA	ND (85)
Mercury		NA	NA	ND (0.10)	NA	ND (0.10)
Selenium		NA	NA	ND (59.9)	NA	ND (59.9)
Silver		NA	NA	ND (20)	NA	ND (20)
Wet Chemistry (mg/kg)						
Total Organic Carbon		NA	NA	15,900	NA	NA
Total Petroleum Hydrocarbons		ND (36.8)	ND (44.3)	ND (41.7)	ND (37.0)	NA

Notes:

D	Value quantitated from a dilution
Dup	Field Duplicate
J	Associated value is estimated
NA	Not analyzed
U	Non-detect at the associated value

TABLE A.2
SOIL SAMPLES
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
LEICA INC.
CHEEKTOWAGA, NEW YORK

Parameter	*Sample ID:*	*BH-5-93*	*BH-6-93*	*BH-6-93*	*BH-AST1-93*	*BH-D2-93*
	Depth:	*8.0-12.8 Ft.*	*1.0-4.0 Ft.*	*8.0-11.0 Ft.*	*2.0-3.5 Ft.*	*2.0 - 3.5 Ft.* *(Dup. of BH-AST1-93)*
	Collection date:	*12/01/93*	*12/01/93*	*12/01/93*	*12/15/93*	*12/15/93*
Volatiles (µg/kg)						
Chloromethane		ND (11)J	ND (12)J	ND (12)J	ND (12)	ND (12)
Bromomethane		ND (11)J	ND (12)J	ND (12)J	ND (12)	ND (12)
Vinyl chloride		ND (11)	ND (12)	ND (12)	ND (12)	ND (12)
Chloroethane		ND (11)	ND (12)	ND (12)	ND (12)	ND (12)
Methylene chloride		ND (11)	ND (12)	ND (12)	1J	2J
Acetone		ND (11)J	73J	ND (12)J	8J	8J
Carbon disulfide		3J	ND (12)	ND (12)	ND (12)J	ND (12)J
1,1-Dichloroethene		ND (11)	ND (12)	ND (12)	ND (12)J	7J
1,1-Dichloroethane		ND (11)	ND (12)	ND (12)	83J	180J
1,2-Dichloroethene (total)		140	ND (12)	ND (12)	570D	660JD
Chloroform		ND (11)	ND (12)	ND (12)	ND (12)	ND (12)
1,2-Dichloroethane		ND (11)	ND (12)	ND (12)	ND (12)	ND (12)
2-Butanone		ND (11)J	2J	ND (12)J	ND (12)J	ND (12)J
1,1,1-Trichloroethane		ND (11)	ND (12)	ND (12)	22J	71J
Carbon tetrachloride		ND (11)	ND (12)	ND (12)	ND (12)	ND (12)
Bromodichloromethane		ND (11)	ND (12)	ND (12)	ND (12)	ND (12)
1,2-Dichloropropane		ND (11)	ND (12)	ND (12)	ND (12)	ND (12)
cis-1,3-Dichloropropene		ND (11)	ND (12)	ND (12)	ND (12)	ND (12)
Trichloroethene		220D	ND (12)	ND (12)	360DJ	850JD
Dibromochloromethane		ND (11)	ND (12)	ND (12)	ND (12)	ND (12)
1,1,2-Trichloroethane		ND (11)	ND (12)	ND (12)	ND (12)	ND (12)
Benzene		ND (11)	ND (12)	ND (12)	ND (12)	ND (12)
trans-1,3-Dichloropropene		ND (11)	ND (12)	ND (12)	ND (12)	ND (12)
Bromoform		ND (11)	ND (12)	ND (12)	ND (12)	ND (12)
4-Methyl-2-pentanone		ND (11)	ND (12)	ND (12)	ND (12)	ND (12)
2-Hexanone		ND (11)J	ND (12)J	ND (12)J	ND (12)	ND (12)
Tetrachloroethene		ND (11)	ND (12)	ND (12)	3J	5J
1,1,2,2-Tetrachloroethane		ND (11)	ND (12)	ND (12)	ND (12)	ND (12)
Toluene		ND (11)	ND (12)	ND (12)	4J	7J
Chlorobenzene		ND (11)	ND (12)	ND (12)	ND (12)	ND (12)
Ethylbenzene		35	ND (12)	ND (12)	ND (12)	ND (12)
Styrene		ND (11)	ND (12)	ND (12)	ND (12)	ND (12)
Xylene (total)		6J	ND (12)	ND (12)	3J	ND (12)
TCLP Volatiles (µg/L)						
Vinyl chloride		ND (10)J	NA	NA	NA	NA
1,1-Dichloroethene		ND (10)	NA	NA	NA	NA
Chloroform		ND (10)	NA	NA	NA	NA
1,2-Dichloroethane		ND (10)	NA	NA	NA	NA
2-Butanone		ND (10)J	NA	NA	NA	NA
Carbon tetrachloride		ND (10)	NA	NA	NA	NA
Trichloroethene		11	NA	NA	NA	NA
Benzene		ND (10)	NA	NA	NA	NA
Tetrachloroethene		ND (10)	NA	NA	NA	NA
Chlorobenzene		ND (10)	NA	NA	NA	NA

TABLE A.2
SOIL SAMPLES
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
LEICA INC.
CHEEKTOWAGA, NEW YORK

Parameter	*Sample ID:*	*BH-5-93*	*BH-6-93*	*BH-6-93*	*BH-AST1-93*	*BH-D2-93*
	Depth:	*8.0-12.8 Ft.*	*1.0-4.0 Ft.*	*8.0-11.0 Ft.*	*2.0-3.5 Ft.*	*2.0 - 3.5 Ft.* *(Dup. of BH-AST1-93)*
	Collection date:	*12/01/93*	*12/01/93*	*12/01/93*	*12/15/93*	*12/15/93*
Semi-Volatiles (ug/kg)						
Phenol		ND (380)	NA	NA	NA	NA
bis(2-Chloroethyl)ether		ND (380)	NA	NA	NA	NA
2-Chlorophenol		ND (380)	NA	NA	NA	NA
1,3-Dichlorobenzene		ND (380)	NA	NA	NA	NA
1,4-Dichlorobenzene		ND (380)	NA	NA	NA	NA
1,2-Dichlorobenzene		ND (380)	NA	NA	NA	NA
2-Methylphenol		ND (380)	NA	NA	NA	NA
2,2'-oxybis(1-Chloropropane)		ND (380)	NA	NA	NA	NA
4-Methylphenol		ND (380)J	NA	NA	NA	NA
N-Nitroso-di-n-propylamine		ND (380)	NA	NA	NA	NA
Hexachloroethane		ND (380)	NA	NA	NA	NA
Nitrobenzene		ND (380)	NA	NA	NA	NA
Isophorone		ND (380)	NA	NA	NA	NA
2-Nitrophenol		ND (380)	NA	NA	NA	NA
2,4-Dimethylphenol		ND (380)	NA	NA	NA	NA
bis(2-Chloroethoxy)methane		ND (380)	NA	NA	NA	NA
2,4-Dichlorophenol		ND (380)	NA	NA	NA	NA
1,2,4-Trichlorobenzene		ND (380)	NA	NA	NA	NA
Naphthalene		ND (380)	NA	NA	NA	NA
4-Chloroaniline		ND (380)	NA	NA	NA	NA
Hexachlorobutadiene		ND (380)	NA	NA	NA	NA
4-Chloro-3-methylphenol		ND (380)	NA	NA	NA	NA
2-Methylnaphthalene		ND (380)	NA	NA	NA	NA
Hexachlorocyclopentadiene		ND (380)J	NA	NA	NA	NA
2,4,6-Trichlorophenol		ND (380)	NA	NA	NA	NA
2,4,5-Trichlorophenol		ND (960)	NA	NA	NA	NA
2-Chloronaphthalene		ND (380)	NA	NA	NA	NA
2-Nitroaniline		ND (960)	NA	NA	NA	NA
Dimethylphthalate		ND (380)	NA	NA	NA	NA
Acenaphthylene		ND (380)	NA	NA	NA	NA
2,6-Dinitrotoluene		ND (380)	NA	NA	NA	NA
3-Nitroaniline		ND (960)	NA	NA	NA	NA
Acenaphthene		ND (380)	NA	NA	NA	NA
2,4-Dinitrophenol		ND (960)	NA	NA	NA	NA
4-Nitrophenol		ND (960)	NA	NA	NA	NA
Dibenzofuran		ND (380)	NA	NA	NA	NA
2,4-Dinitrotoluene		ND (380)	NA	NA	NA	NA
Diethylphthalate		ND (380)	NA	NA	NA	NA

TABLE A.2
SOIL SAMPLES
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
LEICA INC.
CHEEKTOWAGA, NEW YORK

Parameter	*Sample ID:*	*BH-5-93*	*BH-6-93*	*BH-6-93*	*BH-AST1-93*	*BH-D2-93*
	Depth:	*8.0-12.8 Ft.*	*1.0-4.0 Ft.*	*8.0-11.0 Ft.*	*2.0-3.5 Ft.*	*2.0 - 3.5 Ft.* *(Dup. of BH-AST1-93)*
	Collection date:	*12/01/93*	*12/01/93*	*12/01/93*	*12/15/93*	*12/15/93*
Semi-Volatiles (µg/kg) Cont'd.						
4-Chlorophenyl-phenylether		ND (380)	NA	NA	NA	NA
Fluorene		ND (380)	NA	NA	NA	NA
4-Nitroaniline		ND (960)	NA	NA	NA	NA
4,6-Dinitro-2-methylphenol		ND (960)	NA	NA	NA	NA
N-Nitrosodiphenylamine(1)		ND (380)J	NA	NA	NA	NA
4-Bromophenyl-phenylether		ND (380)	NA	NA	NA	NA
Hexachlorobenzene		ND (380)	NA	NA	NA	NA
Pentachlorophenol		ND (960)	NA	NA	NA	NA
Phenanthrene		130J	NA	NA	NA	NA
Anthracene		ND (380)	NA	NA	NA	NA
Carbazole		ND (380)	NA	NA	NA	NA
Di-n-butylphthalate		99J	NA	NA	NA	NA
Fluoranthene		190J	NA	NA	NA	NA
Pyrene		110J	NA	NA	NA	NA
Butylbenzylphthalate		ND (380)	NA	NA	NA	NA
3,3'-Dichlorobenzidine		ND (380)	NA	NA	NA	NA
Benzo(a)anthracene		55J	NA	NA	NA	NA
Chrysene		73J	NA	NA	NA	NA
bis(2-Ethylhexyl)phthalate		ND (960)	NA	NA	NA	NA
Di-n-octylphthalate		ND (380)J	NA	NA	NA	NA
Benzo(b)fluoranthene		ND (380)	NA	NA	NA	NA
Benzo(k)fluoranthene		ND (380)	NA	NA	NA	NA
Benzo(a)pyrene		61J	NA	NA	NA	NA
Ideno(1,2,3-cd)pyrene		ND (380)	NA	NA	NA	NA
Dibenz(a,h)anthracene		ND (380)	NA	NA	NA	NA
Benzo(g,h,i)perylene		ND (380)	NA	NA	NA	NA
Petroleum Products (mg/kg)						
Gasoline		Not Present	NA	NA	NA	NA
Kerosene		ND (33)	NA	NA	NA	NA
Fuel oil		23J	NA	NA	NA	NA
Lubricating oil		Present	NA	NA	NA	NA

TABLE A.2
SOIL SAMPLES
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
LEICA INC.
CHEEKTOWAGA, NEW YORK

Parameter	***Sample ID:***	***BH-5-93***	***BH-6-93***	***BH-6-93***	***BH-AST1-93***	***BH-D2-93***
	Depth:	***8.0-12.8 Ft.***	***1.0-4.0 Ft.***	***8.0-11.0 Ft.***	***2.0-3.5 Ft.***	***2.0 - 3.5 Ft.***
						(Dup. of BH-AST1-93)
	Collection date:	***12/01/93***	***12/01/93***	***12/01/93***	***12/15/93***	***12/15/93***
TCLP Semi-Volatiles (ug/L)						
1,4-Dichlorobenzene		ND (10)	NA	NA	NA	NA
2-Methylphenol		ND (10)	NA	NA	NA	NA
Hexachloroethane		ND (10)	NA	NA	NA	NA
Nitrobenzene		ND (10)	NA	NA	NA	NA
Hexachlorobutadiene		ND (10)	NA	NA	NA	NA
2,4,6-Trichlorophenol		ND (10)	NA	NA	NA	NA
2,4,5-Trichlorophenol		ND (26)	NA	NA	NA	NA
2,4-Dinitrotoluene		ND (10)	NA	NA	NA	NA
Hexachlorobenzene		ND (10)	NA	NA	NA	NA
Pentachlorophenol		ND (26)	NA	NA	NA	NA
Pyridine		ND (10)J	NA	NA	NA	NA
3/4-Methylphenol		ND (10)	NA	NA	NA	NA
3-Methylphenol		-	NA	NA	-	-
4-Methylphenol		-	NA	NA	-	-
Metals (mg/kg)						
Aluminum		4,310	15,500	3,810	12,900	13,300
Antimony		ND (1.9)	ND (1.9)	ND (1.9)	ND (4.3)	ND (4.3)
Arsenic		1.3	4.6	2	3.5J	5.7J
Barium		39.5	110	35	120	157
Beryllium		ND (0.070)	ND (0.70)	ND (0.070)	0.72	0.81
Cadmium		ND (0.84)	1.9	ND (0.70)	ND (0.77)	ND (0.78)
Calcium		71,000	56,000	81,800	81,900	88,400
Chromium		9.7	22.2	6.7	19.2	19.6
Cobalt		3.9	10.3	3.1	9.5	8.0
Copper		9.4	20.7	8.4	545J	42.3J
Iron		9,430	25,300	8,250	19,300	22,800
Lead		6.8	14.3	12.4	41.2J	84.7J
Magnesium		28,300	17,200	37,500	19,800	19,900
Manganese		317	456	273	685	704
Mercury		ND (0.060)	ND (0.060)	ND (0.060)	0.24J	0.10J
Nickel		ND (6.5)	25.2	ND (5.3)	27.9	28.8
Potassium		1,180	2,490	1,040	2,100	2,340
Selenium		ND (0.23)	ND (0.23)	ND (0.23)	ND (0.37)	ND (0.38)J
Silver		ND (0.41)	ND (0.42)	ND (0.42)	ND (0.72)	ND (0.73)
Sodium		ND (197)	269	ND (148)	420	417
Thallium		ND (0.30)	ND (0.30)	ND (0.30)	ND (0.30)	ND (0.31)
Vanadium		11.1	31.6	10.4	23.7	27.9
Zinc		52.8	70.4	44.9	152J	96.1J

TABLE A.2
SOIL SAMPLES
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
LEICA INC.
CHEEKTOWAGA, NEW YORK

Parameter	*Sample ID:*	*BH-5-93*	*BH-6-93*	*BH-6-93*	*BH-AST1-93*	*BH-D2-93*
	Depth:	*8.0-12.8 Ft.*	*1.0-4.0 Ft.*	*8.0-11.0 Ft.*	*2.0-3.5 Ft.*	*2.0 - 3.5 Ft.* *(Dup. of BH-AST1-93)*
	Collection date:	*12/01/93*	*12/01/93*	*12/01/93*	*12/15/93*	*12/15/93*
TCLP Metals (µg/L)						
Arsenic		ND (41.5)	NA	NA	NA	NA
Barium		917	NA	NA	NA	NA
Cadmium		ND (3.3)	NA	NA	NA	NA
Chromium		ND (8.9)	NA	NA	NA	NA
Lead		ND (17.5)	NA	NA	NA	NA
Mercury		ND (0.10)	NA	NA	NA	NA
Selenium		ND (59.9)	NA	NA	NA	NA
Silver		ND (20)	NA	NA	NA	NA
Wet Chemistry (mg/kg)						
Total Organic Carbon		9,600	NA	NA	NA	NA
Total Petroleum Hydrocarbons		ND (36.1)	ND (36.8)	ND (36.7)	358J	522J

Notes:

D	Value quantitated from a dilution
Dup	Field Duplicate
J	Associated value is estimated
NA	Not analyzed
U	Non-detect at the associated value

TABLE A.2
SOIL SAMPLES
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
LEICA INC.
CHEEKTOWAGA, NEW YORK

Parameter	*Sample ID:*	*BH-DS1-93*	*BH-DS2-93*	*BH-DS3-93*	*BH-EDW1-93*	*BH-T1-93*
	Depth:	*1.0-4.0 Ft.*	*0.5-3.0 Ft.*	*0.5-1.2 Ft.*	*8.0-11.0 Ft.*	*0.5-1.5 Ft.*
	Collection date:	*12/13/93*	*12/13/93*	*12/13/93*	*12/14/93*	*12/14/93*
Volatiles (µg/kg)						
Chloromethane		ND (12)	ND (11)J	ND (11)J	ND (2,900)	ND (12)
Bromomethane		ND (12)	ND (11)J	ND (11)J	ND (2,900)	ND (12)
Vinyl chloride		ND (12)	ND (11)J	ND (11)J	ND (2,900)	ND (12)
Chloroethane		ND (12)	ND (11)J	ND (11)J	ND (2,900)	ND (12)
Methylene chloride		3J	ND (11)J	93	ND (2,900)	ND (12)
Acetone		12J	29J	ND (11)	ND (2,900)	ND (12)J
Carbon disulfide		ND (12)	18J	ND (11)J	ND (2,900)	ND (12)J
1,1-Dichloroethene		4J	ND (1,400)D	ND (11)	ND (2,900)	120
1,1-Dichloroethane		19	ND (1,400)D	7J	ND (2,900)	6J
1,2-Dichloroethene (total)		ND (12)	ND (11)J	ND (11)	ND (2,900)	ND (12)
Chloroform		ND (12)	ND (11)J	ND (11)	ND (2,900)	ND (12)
1,2-Dichloroethane		ND (12)	ND (11)J	ND (11)	ND (2,900)	ND (12)
2-Butanone		ND (12)J	15J	ND (11)J	ND (2,900)	ND (12)J
1,1,1-Trichloroethane		25	16,000D	180J	21,000D	1,200JD
Carbon tetrachloride		ND (12)	ND (11)J	ND (11)J	ND (2,900)	ND (12)
Bromodichloromethane		ND (12)	ND (11)J	ND (11)J	ND (2,900)	ND (12)
1,2-Dichloropropane		ND (12)	ND (11)J	ND (11)J	ND (2,900)	ND (12)
cis-1,3-Dichloropropene		ND (12)	ND (11)J	ND (11)J	ND (2,900)	ND (12)
Trichloroethene		47	4J	ND (11)J	1,700JD	ND (1,500)D
Dibromochloromethane		ND (12)	ND (11)J	ND (11)J	ND (2,900)	ND (12)
1,1,2-Trichloroethane		ND (12)	ND (11)J	ND (11)J	ND (2,900)	ND (12)
Benzene		ND (12)	ND (11)J	1J	ND (2,900)	ND (12)
trans-1,3-Dichloropropene		ND (12)	ND (11)J	ND (11)J	ND (2,900)	ND (12)
Bromoform		ND (12)	ND (11)J	ND (11)J	ND (2,900)	ND (12)
4-Methyl-2-pentanone		ND (12)	ND (11)J	11J	ND (2,900)	ND (12)
2-Hexanone		ND (12)	ND (11)J	4J	ND (2,900)	ND (12)
Tetrachloroethene		ND (12)	ND (11)J	8J	ND (2,900)	ND (12)
1,1,2,2-Tetrachloroethane		ND (12)	ND (11)J	ND (11)J	ND (2,900)	ND (12)
Toluene		ND (12)	23J	25J	1,800JD	160JD
Chlorobenzene		ND (12)	ND (11)J	ND (11)J	ND (2,900)	ND (12)
Ethylbenzene		7J	48J	37J	17,000D	1,100JD
Styrene		ND (12)	ND (11)J	ND (11)J	ND (2,900)	ND (12)
Xylene (total)		2J	560JD	240J	92,000D	7,000D
TCLP Volatiles (µg/L)						
Vinyl chloride		NA	NA	NA	ND (10)J	NA
1,1-Dichloroethene		NA	NA	NA	26	NA
Chloroform		NA	NA	NA	ND (10)	NA
1,2-Dichloroethane		NA	NA	NA	ND (10)	NA
2-Butanone		NA	NA	NA	ND (10)J	NA
Carbon tetrachloride		NA	NA	NA	ND (10)	NA
Trichloroethene		NA	NA	NA	130	NA
Benzene		NA	NA	NA	ND (10)	NA
Tetrachloroethene		NA	NA	NA	ND (10)	NA
Chlorobenzene		NA	NA	NA	ND (10)	NA

TABLE A.2
SOIL SAMPLES
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
LEICA INC.
CHEEKTOWAGA, NEW YORK

Parameter	*Sample ID:*	*BH-DS1-93*	*BH-DS2-93*	*BH-DS3-93*	*BH-EDW1-93*	*BH-T1-93*
	Depth:	*1.0-4.0 Ft.*	*0.5-3.0 Ft.*	*0.5-1.2 Ft.*	*8.0-11.0 Ft.*	*0.5-1.5 Ft.*
	Collection date:	*12/13/93*	*12/13/93*	*12/13/93*	*12/14/93*	*12/14/93*
Semi-Volatiles (μg/kg)						
Phenol		NA	NA	NA	ND (380)	NA
bis(2-Chloroethyl)ether		NA	NA	NA	ND (380)	NA
2-Chlorophenol		NA	NA	NA	ND (380)	NA
1,3-Dichlorobenzene		NA	NA	NA	ND (380)	NA
1,4-Dichlorobenzene		NA	NA	NA	ND (380)	NA
1,2-Dichlorobenzene		NA	NA	NA	ND (380)	NA
2-Methylphenol		NA	NA	NA	ND (380)	NA
2,2'-oxybis(1-Chloropropane)		NA	NA	NA	ND (380)	NA
4-Methylphenol		NA	NA	NA	ND (380)	NA
N-Nitroso-di-n-propylamine		NA	NA	NA	ND (380)	NA
Hexachloroethane		NA	NA	NA	ND (380)	NA
Nitrobenzene		NA	NA	NA	ND (380)	NA
Isophorone		NA	NA	NA	ND (380)	NA
2-Nitrophenol		NA	NA	NA	ND (380)	NA
2,4-Dimethylphenol		NA	NA	NA	ND (380)	NA
bis(2-Chloroethoxy)methane		NA	NA	NA	ND (380)	NA
2,4-Dichlorophenol		NA	NA	NA	ND (380)	NA
1,2,4-Trichlorobenzene		NA	NA	NA	ND (380)	NA
Naphthalene		NA	NA	NA	ND (380)	NA
4-Chloroaniline		NA	NA	NA	ND (380)	NA
Hexachlorobutadiene		NA	NA	NA	ND (380)	NA
4-Chloro-3-methylphenol		NA	NA	NA	ND (380)	NA
2-Methylnaphthalene		NA	NA	NA	ND (380)	NA
Hexachlorocyclopentadiene		NA	NA	NA	ND (380)	NA
2,4,6-Trichlorophenol		NA	NA	NA	ND (380)	NA
2,4,5-Trichlorophenol		NA	NA	NA	ND (950)	NA
2-Chloronaphthalene		NA	NA	NA	ND (380)	NA
2-Nitroaniline		NA	NA	NA	ND (950)	NA
Dimethylphthalate		NA	NA	NA	ND (380)	NA
Acenaphthylene		NA	NA	NA	ND (380)	NA
2,6-Dinitrotoluene		NA	NA	NA	ND (380)	NA
3-Nitroaniline		NA	NA	NA	ND (950)	NA
Acenaphthene		NA	NA	NA	ND (380)	NA
2,4-Dinitrophenol		NA	NA	NA	ND (950)J	NA
4-Nitrophenol		NA	NA	NA	ND (950)	NA
Dibenzofuran		NA	NA	NA	ND (380)	NA
2,4-Dinitrotoluene		NA	NA	NA	ND (380)	NA
Diethylphthalate		NA	NA	NA	ND (380)	NA

TABLE A.2
SOIL SAMPLES
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
LEICA INC.
CHEEKTOWAGA, NEW YORK

Parameter	*Sample ID:*	*BH-DS1-93*	*BH-DS2-93*	*BH-DS3-93*	*BH-EDW1-93*	*BH-T1-93*
	Depth:	*1.0-4.0 Ft.*	*0.5-3.0 Ft.*	*0.5-1.2 Ft.*	*8.0-11.0 Ft.*	*0.5-1.5 Ft.*
	Collection date:	*12/13/93*	*12/13/93*	*12/13/93*	*12/14/93*	*12/14/93*
Semi-Volatiles (μg/kg) Cont'd.						
4-Chlorophenyl-phenylether		NA	NA	NA	ND (380)	NA
Fluorene		NA	NA	NA	ND (380)	NA
4-Nitroaniline		NA	NA	NA	ND (950)J	NA
4,6-Dinitro-2-methylphenol		NA	NA	NA	ND (950)	NA
N-Nitrosodiphenylamine(1)		NA	NA	NA	ND (380)	NA
4-Bromophenyl-phenylether		NA	NA	NA	ND (380)	NA
Hexachlorobenzene		NA	NA	NA	ND (380)	NA
Pentachlorophenol		NA	NA	NA	ND (950)	NA
Phenanthrene		NA	NA	NA	ND (380)	NA
Anthracene		NA	NA	NA	ND (380)	NA
Carbazole		NA	NA	NA	ND (380)J	NA
Di-n-butylphthalate		NA	NA	NA	ND (380)	NA
Fluoranthene		NA	NA	NA	ND (380)	NA
Pyrene		NA	NA	NA	ND (380)	NA
Butylbenzylphthalate		NA	NA	NA	ND (380)	NA
3,3'-Dichlorobenzidine		NA	NA	NA	ND (380)	NA
Benzo(a)anthracene		NA	NA	NA	ND (380)	NA
Chrysene		NA	NA	NA	ND (380)	NA
bis(2-Ethylhexyl)phthalate		NA	NA	NA	ND (380)	NA
Di-n-octylphthalate		NA	NA	NA	ND (380)J	NA
Benzo(b)fluoranthene		NA	NA	NA	ND (380)J	NA
Benzo(k)fluoranthene		NA	NA	NA	ND (380)	NA
Benzo(a)pyrene		NA	NA	NA	ND (380)	NA
Ideno(1,2,3-cd)pyrene		NA	NA	NA	ND (380)	NA
Dibenz(a,h)anthracene		NA	NA	NA	ND (380)	NA
Benzo(g,h,i)perylene		NA	NA	NA	ND (380)	NA
Petroleum Products (mg/kg)						
Gasoline		NA	NA	NA	NA	NA
Kerosene		NA	NA	NA	NA	NA
Fuel oil		NA	NA	NA	NA	NA
Lubricating oil		NA	NA	NA	NA	NA

TABLE A.2
SOIL SAMPLES
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
LEICA INC.
CHEEKTOWAGA, NEW YORK

Parameter	*Sample ID:*	*BH-DS1-93*	*BH-DS2-93*	*BH-DS3-93*	*BH-EDW1-93*	*BH-T1-93*
	Depth:	*1.0-4.0 Ft.*	*0.5-3.0 Ft.*	*0.5-1.2 Ft.*	*8.0-11.0 Ft.*	*0.5-1.5 Ft.*
	Collection date:	*12/13/93*	*12/13/93*	*12/13/93*	*12/14/93*	*12/14/93*
TCLP Semi-Volatiles (ug/L)						
1,4-Dichlorobenzene		NA	NA	NA	ND (10)J	NA
2-Methylphenol		NA	NA	NA	ND (10)J	NA
Hexachloroethane		NA	NA	NA	ND (10)J	NA
Nitrobenzene		NA	NA	NA	ND (10)J	NA
Hexachlorobutadiene		NA	NA	NA	ND (10)J	NA
2,4,6-Trichlorophenol		NA	NA	NA	ND (10)J	NA
2,4,5-Trichlorophenol		NA	NA	NA	ND (26)J	NA
2,4-Dinitrotoluene		NA	NA	NA	ND (10)J	NA
Hexachlorobenzene		NA	NA	NA	ND (10)J	NA
Pentachlorophenol		NA	NA	NA	ND (26)J	NA
Pyridine		NA	NA	NA	ND (10)J	NA
3/4-Methylphenol		NA	NA	NA	ND (10)J	NA
3-Methylphenol		-	-	-	-	-
4-Methylphenol		-	-	-	-	-
Metals (mg/kg)						
Aluminum		13,900	11,700	17,800	1,600	NA
Antimony		ND (4.4)	ND (4.2)	ND (4.1)J	ND (4.2)	NA
Arsenic		1.8B	4.9	2.6	0.98	NA
Barium		151	113	296	15.9	NA
Beryllium		0.85	0.63	1.3	ND (0.21)	NA
Cadmium		ND (0.79)	ND (0.77)	ND (0.73)	ND (0.76)	NA
Calcium		120,000	76,700	26,000J	52,000	NA
Chromium		17.7	19.4	20.6	ND (2.0)	NA
Cobalt		7.8	8.4	11.7	ND (1.6)	NA
Copper		25.2	21.1	53.4J	5.3	NA
Iron		17,300	19,400	27,200	4,150	NA
Lead		12.3	13.2	64.9J	6.9	NA
Magnesium		19,500	19,100	6,770	22,100	NA
Manganese		703	509	1,220J	213	NA
Mercury		ND (0.050)	ND (0.050)	0.07	ND (0.050)	NA
Nickel		208	41.6	22.8	ND (4.5)	NA
Potassium		2,250	1,540	1,620	398	NA
Selenium		ND (0.38)J	ND (0.37)	0.99J	ND (0.37)J	NA
Silver		ND (0.74)	ND (0.72)	ND (0.69)	ND (0.71)	NA
Sodium		ND (254)	ND (221)	1,010	ND (192)	NA
Thallium		ND (0.31)J	ND (0.30)	ND (0.29)J	ND (0.30)J	NA
Vanadium		20.6	21.3	28.6	5.6	NA
Zinc		74.9	77.7	115J	56.2	NA

TABLE A.2
SOIL SAMPLES
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
LEICA INC.
CHEEKTOWAGA, NEW YORK

Parameter	*Sample ID:* *Depth:*	*BH-DS1-93* *1.0-4.0 Ft.*	*BH-DS2-93* *0.5-3.0 Ft.*	*BH-DS3-93* *0.5-1.2 Ft.*	*BH-EDW1-93* *8.0-11.0 Ft.*	*BH-T1-93* *0.5-1.5 Ft.*
	Collection date:	*12/13/93*	*12/13/93*	*12/13/93*	*12/14/93*	*12/14/93*
TCLP Metals (µg/L)						
Arsenic		NA	NA	NA	ND (12.8)	NA
Barium		NA	NA	NA	694	NA
Cadmium		NA	NA	NA	ND (2.9)	NA
Chromium		NA	NA	NA	4.4	NA
Lead		NA	NA	NA	ND (8.2)	NA
Mercury		NA	NA	NA	ND (0.10)	NA
Selenium		NA	NA	NA	127	NA
Silver		NA	NA	NA	ND (20)	NA
Wet Chemistry (mg/kg)						
Total Organic Carbon		NA	NA	NA	NA	NA
Total Petroleum Hydrocarbons		ND (37.4)	1,420	624	ND (35.8)	236

Notes:

D	Value quantitated from a dilution
Dup	Field Duplicate
J	Associated value is estimated
NA	Not analyzed
U	Non-detect at the associated value

TABLE A.2
SOIL SAMPLES
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
LEICA INC.
CHEEKTOWAGA, NEW YORK

Parameter	*Sample ID:*	*BH-T2-93*	*BH-T3-93*	*BH-WDW1-93*	*MW-13*	*MW-13*
	Depth:	*0.0-2.0 Ft.*	*2.0-4.0 Ft.*	*0.7-0.9 Ft.*	*2.0-4.0 Ft.*	*8.0-11.0 Ft.*
	Collection date:	*12/14/93*	*12/14/93*	*12/15/93*	*12/08/93*	*12/08/93*
Volatiles (μg/kg)						
Chloromethane		ND (11)	ND (13)J	ND (11)J	ND (12)	ND (11)
Bromomethane		ND (11)	ND (13)	ND (11)	ND (12)	ND (11)
Vinyl chloride		ND (11)	ND (13)	ND (11)	ND (12)	ND (11)
Chloroethane		ND (11)	ND (13)	ND (11)	ND (12)	ND (11)
Methylene chloride		ND (11)	ND (13)	ND (11)	ND (12)	ND (11)
Acetone		13J	58J	ND (11)J	3J	7J
Carbon disulfide		ND (11)J	5J	ND (11)J	ND (12)	1J
1,1-Dichloroethene		ND (11)	ND (13)	ND (11)	ND (12)	ND (11)
1,1-Dichloroethane		ND (11)	ND (13)	ND (11)	ND (12)	ND (11)
1,2-Dichloroethene (total)		ND (11)	ND (13)	ND (11)	ND (12)J	ND (11)J
Chloroform		ND (11)	ND (13)	ND (11)	ND (12)	ND (11)
1,2-Dichloroethane		ND (11)	ND (13)	ND (11)	ND (12)	ND (11)
2-Butanone		ND (11)J	15J	ND (11)J	ND (12)J	ND (11)J
1,1,1-Trichloroethane		54	2J	ND (11)	ND (12)	ND (11)
Carbon tetrachloride		ND (11)	ND (13)	ND (11)	ND (12)	ND (11)
Bromodichloromethane		ND (11)	ND (13)	ND (11)	ND (12)	ND (11)
1,2-Dichloropropane		ND (11)	ND (13)	ND (11)	ND (12)	ND (11)
cis-1,3-Dichloropropene		ND (11)	ND (13)	ND (11)	ND (12)	ND (11)
Trichloroethene		2J	ND (13)	ND (11)	ND (12)	ND (11)
Dibromochloromethane		ND (11)	ND (13)	ND (11)	ND (12)	ND (11)
1,1,2-Trichloroethane		ND (11)	ND (13)	ND (11)	ND (12)	ND (11)
Benzene		ND (11)	ND (13)	ND (11)	ND (12)	ND (11)
trans-1,3-Dichloropropene		ND (11)	ND (13)	ND (11)	ND (12)	ND (11)
Bromoform		ND (11)	ND (13)J	ND (11)J	ND (12)	ND (11)
4-Methyl-2-pentanone		ND (11)	ND (13)	ND (11)	ND (12)	ND (11)
2-Hexanone		ND (11)	ND (13)J	ND (11)J	ND (12)	ND (11)
Tetrachloroethene		ND (11)	ND (13)	ND (11)	ND (12)	ND (11)
1,1,2,2-Tetrachloroethane		ND (11)	ND (13)	ND (11)	ND (12)J	ND (11)J
Toluene		8J	ND (13)	ND (11)	ND (12)	ND (11)
Chlorobenzene		ND (11)	ND (13)	ND (11)	ND (12)	ND (11)
Ethylbenzene		8J	ND (13)	ND (11)	ND (12)	ND (11)
Styrene		ND (11)	ND (13)	ND (11)	ND (12)	ND (11)
Xylene (total)		41	ND (13)	ND (11)	ND (12)	ND (11)
TCLP Volatiles (μg/L)						
Vinyl chloride		NA	NA	NA	NA	NA
1,1-Dichloroethene		NA	NA	NA	NA	NA
Chloroform		NA	NA	NA	NA	NA
1,2-Dichloroethane		NA	NA	NA	NA	NA
2-Butanone		NA	NA	NA	NA	NA
Carbon tetrachloride		NA	NA	NA	NA	NA
Trichloroethene		NA	NA	NA	NA	NA
Benzene		NA	NA	NA	NA	NA
Tetrachloroethene		NA	NA	NA	NA	NA
Chlorobenzene		NA	NA	NA	NA	NA

TABLE A.2
SOIL SAMPLES
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
LEICA INC.
CHEEKTOWAGA, NEW YORK

Parameter	*Sample ID:*	*BH-T2-93*	*BH-T3-93*	*BH-WDW1-93*	*MW-13*	*MW-13*
	Depth:	*0.0-2.0 Ft.*	*2.0-4.0 Ft.*	*0.7-0.9 Ft.*	*2.0-4.0 Ft.*	*8.0-11.0 Ft.*
	Collection date:	*12/14/93*	*12/14/93*	*12/15/93*	*12/08/93*	*12/08/93*
Semi-Volatiles (µg/kg)						
Phenol		NA	NA	NA	NA	NA
bis(2-Chloroethyl)ether		NA	NA	NA	NA	NA
2-Chlorophenol		NA	NA	NA	NA	NA
1,3-Dichlorobenzene		NA	NA	NA	NA	NA
1,4-Dichlorobenzene		NA	NA	NA	NA	NA
1,2-Dichlorobenzene		NA	NA	NA	NA	NA
2-Methylphenol		NA	NA	NA	NA	NA
2,2'-oxybis(1-Chloropropane)		NA	NA	NA	NA	NA
4-Methylphenol		NA	NA	NA	NA	NA
N-Nitroso-di-n-propylamine		NA	NA	NA	NA	NA
Hexachloroethane		NA	NA	NA	NA	NA
Nitrobenzene		NA	NA	NA	NA	NA
Isophorone		NA	NA	NA	NA	NA
2-Nitrophenol		NA	NA	NA	NA	NA
2,4-Dimethylphenol		NA	NA	NA	NA	NA
bis(2-Chloroethoxy)methane		NA	NA	NA	NA	NA
2,4-Dichlorophenol		NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene		NA	NA	NA	NA	NA
Naphthalene		NA	NA	NA	NA	NA
4-Chloroaniline		NA	NA	NA	NA	NA
Hexachlorobutadiene		NA	NA	NA	NA	NA
4-Chloro-3-methylphenol		NA	NA	NA	NA	NA
2-Methylnaphthalene		NA	NA	NA	NA	NA
Hexachlorocyclopentadiene		NA	NA	NA	NA	NA
2,4,6-Trichlorophenol		NA	NA	NA	NA	NA
2,4,5-Trichlorophenol		NA	NA	NA	NA	NA
2-Chloronaphthalene		NA	NA	NA	NA	NA
2-Nitroaniline		NA	NA	NA	NA	NA
Dimethylphthalate		NA	NA	NA	NA	NA
Acenaphthylene		NA	NA	NA	NA	NA
2,6-Dinitrotoluene		NA	NA	NA	NA	NA
3-Nitroaniline		NA	NA	NA	NA	NA
Acenaphthene		NA	NA	NA	NA	NA
2,4-Dinitrophenol		NA	NA	NA	NA	NA
4-Nitrophenol		NA	NA	NA	NA	NA
Dibenzofuran		NA	NA	NA	NA	NA
2,4-Dinitrotoluene		NA	NA	NA	NA	NA
Diethylphthalate		NA	NA	NA	NA	NA

TABLE A.2
SOIL SAMPLES
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
LEICA INC.
CHEEKTOWAGA, NEW YORK

Parameter	*Sample ID:*	*BH-T2-93*	*BH-T3-93*	*BH-WDW1-93*	*MW-13*	*MW-13*
	Depth:	*0.0-2.0 Ft.*	*2.0-4.0 Ft.*	*0.7-0.9 Ft.*	*2.0-4.0 Ft.*	*8.0-11.0 Ft.*
	Collection date:	*12/14/93*	*12/14/93*	*12/15/93*	*12/08/93*	*12/08/93*
Semi-Volatiles (ug/kg) Cont'd.						
4-Chlorophenyl-phenylether		NA	NA	NA	NA	NA
Fluorene		NA	NA	NA	NA	NA
4-Nitroaniline		NA	NA	NA	NA	NA
4,6-Dinitro-2-methylphenol		NA	NA	NA	NA	NA
N-Nitrosodiphenylamine(1)		NA	NA	NA	NA	NA
4-Bromophenyl-phenylether		NA	NA	NA	NA	NA
Hexachlorobenzene		NA	NA	NA	NA	NA
Pentachlorophenol		NA	NA	NA	NA	NA
Phenanthrene		NA	NA	NA	NA	NA
Anthracene		NA	NA	NA	NA	NA
Carbazole		NA	NA	NA	NA	NA
Di-n-butylphthalate		NA	NA	NA	NA	NA
Fluoranthene		NA	NA	NA	NA	NA
Pyrene		NA	NA	NA	NA	NA
Butylbenzylphthalate		NA	NA	NA	NA	NA
3,3'-Dichlorobenzidine		NA	NA	NA	NA	NA
Benzo(a)anthracene		NA	NA	NA	NA	NA
Chrysene		NA	NA	NA	NA	NA
bis(2-Ethylhexyl)phthalate		NA	NA	NA	NA	NA
Di-n-octylphthalate		NA	NA	NA	NA	NA
Benzo(b)fluoranthene		NA	NA	NA	NA	NA
Benzo(k)fluoranthene		NA	NA	NA	NA	NA
Benzo(a)pyrene		NA	NA	NA	NA	NA
Ideno(1,2,3-cd)pyrene		NA	NA	NA	NA	NA
Dibenz(a,h)anthracene		NA	NA	NA	NA	NA
Benzo(g,h,i)perylene		NA	NA	NA	NA	NA
Petroleum Products (mg/kg)						
Gasoline		NA	NA	NA	NA	NA
Kerosene		NA	NA	NA	NA	NA
Fuel oil		NA	NA	NA	NA	NA
Lubricating oil		NA	NA	NA	NA	NA

TABLE A.2
SOIL SAMPLES
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
LEICA INC.
CHEEKTOWAGA, NEW YORK

Parameter	*Sample ID:*	*BH-T2-93*	*BH-T3-93*	*BH-WDW1-93*	*MW-13*	*MW-13*
	Depth:	*0.0-2.0 Ft.*	*2.0-4.0 Ft.*	*0.7-0.9 Ft.*	*2.0-4.0 Ft.*	*8.0-11.0 Ft.*
	Collection date:	*12/14/93*	*12/14/93*	*12/15/93*	*12/08/93*	*12/08/93*
TCLP Semi-Volatiles (µg/L)						
1,4-Dichlorobenzene		NA	NA	NA	NA	NA
2-Methylphenol		NA	NA	NA	NA	NA
Hexachloroethane		NA	NA	NA	NA	NA
Nitrobenzene		NA	NA	NA	NA	NA
Hexachlorobutadiene		NA	NA	NA	NA	NA
2,4,6-Trichlorophenol		NA	NA	NA	NA	NA
2,4,5-Trichlorophenol		NA	NA	NA	NA	NA
2,4-Dinitrotoluene		NA	NA	NA	NA	NA
Hexachlorobenzene		NA	NA	NA	NA	NA
Pentachlorophenol		NA	NA	NA	NA	NA
Pyridine		NA	NA	NA	NA	NA
3/4-Methylphenol		NA	NA	NA	NA	NA
3-Methylphenol		-	-	-	NA	NA
4-Methylphenol		-	-	-	NA	NA
Metals (mg/kg)						
Aluminum		NA	NA	23,500	13,200	3,350
Antimony		NA	NA	ND (4.2)	ND (1.9)	ND (1.8)
Arsenic		NA	NA	5.6	1.8	1.2J
Barium		NA	NA	357	185	30.9
Beryllium		NA	NA	2.6	ND (0.48)	ND (0.070)
Cadmium		NA	NA	ND (0.75)	2.0	ND (0.85)
Calcium		NA	NA	92,900	91,200	66,200
Chromium		NA	NA	17.5	19.5	6.9
Cobalt		NA	NA	5.5	10.7	2.8
Copper		NA	NA	71.8	24.5	6.8
Iron		NA	NA	14,200	23,900	7,580
Lead		NA	NA	54.3	13.1	6.8
Magnesium		NA	NA	13,200	19,300	27,700
Manganese		NA	NA	2,700	655	257
Mercury		NA	NA	ND (0.050)	ND (0.060)	ND (0.050)
Nickel		NA	NA	22.9	24.5	ND (5.6)
Potassium		NA	NA	1,790	2,190	924J
Selenium		NA	NA	ND (0.36)	ND (0.24)	ND (0.22)
Silver		NA	NA	ND (0.71)	ND (0.42)	ND (0.40)
Sodium		NA	NA	459	ND (130)	ND (137)
Thallium		NA	NA	ND (0.30)	ND (0.31)	ND (0.29)
Vanadium		NA	NA	15.4	25.6	10.6
Zinc		NA	NA	132	69.2	51.2

TABLE A.2
SOIL SAMPLES
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
LEICA INC.
CHEEKTOWAGA, NEW YORK

Parameter	*Sample ID:*	*BH-T2-93*	*BH-T3-93*	*BH-WDW1-93*	*MW-13*	*MW-13*
	Depth:	*0.0-2.0 Ft.*	*2.0-4.0 Ft.*	*0.7-0.9 Ft.*	*2.0-4.0 Ft.*	*8.0-11.0 Ft.*
	Collection date:	*12/14/93*	*12/14/93*	*12/15/93*	*12/08/93*	*12/08/93*
TCLP Metals (µg/L)						
Arsenic		NA	NA	NA	NA	NA
Barium		NA	NA	NA	NA	NA
Cadmium		NA	NA	NA	NA	NA
Chromium		NA	NA	NA	NA	NA
Lead		NA	NA	NA	NA	NA
Mercury		NA	NA	NA	NA	NA
Selenium		NA	NA	NA	NA	NA
Silver		NA	NA	NA	NA	NA
Wet Chemistry (mg/kg)						
Total Organic Carbon		NA	NA	NA	NA	NA
Total Petroleum Hydrocarbons		54.8	ND (40.0)	ND (35.9)	ND (36.9)	ND (34.9)

Notes:

D	Value quantitated from a dilution
Dup	Field Duplicate
J	Associated value is estimated
NA	Not analyzed
U	Non-detect at the associated value

TABLE A.2
SOIL SAMPLES
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
LEICA INC.
CHEEKTOWAGA, NEW YORK

Parameter	*Sample ID:*	*BH-D1-93*	*MW-14*	*MW-14*	*MW-5A-93*	*MW-5A-93*
	Depth:	*8.0 - 11.0 Ft.*	*0.0-2.0 Ft.*	*10.0-11.0 Ft.*	*1.0-4.5 Ft.*	*8.0-11.8 Ft.*
		(Dup. of MW-13)				
	Collection date:	*12/08/93*	*12/06/93*	*12/06/93*	*12/01/93*	*12/01/93*
Volatiles (ug/kg)						
Chloromethane		ND (11)	ND (12)	ND (12)	ND (11)J	ND (12)
Bromomethane		2J	ND (12)	ND (12)	ND (11)J	ND (12)
Vinyl chloride		ND (11)	ND (12)	ND (12)	ND (11)	ND (12)
Chloroethane		ND (11)	ND (12)	ND (12)	ND (11)	ND (12)
Methylene chloride		ND (11)	ND (12)	ND (12)	ND (11)	ND (12)
Acetone		2J	ND (12)J	4J	14J	5J
Carbon disulfide		2J	ND (12)	ND (12)	ND (11)	1J
1,1-Dichloroethene		ND (11)	ND (12)	ND (12)	ND (11)	ND (12)
1,1-Dichloroethane		ND (11)	ND (12)	ND (12)	ND (11)	ND (12)
1,2-Dichloroethene (total)		ND (11)J	ND (12)J	150J	ND (11)	ND (12)
Chloroform		ND (11)	ND (12)	ND (12)	ND (11)	ND (12)
1,2-Dichloroethane		ND (11)	ND (12)	ND (12)	ND (11)	ND (12)
2-Butanone		ND (11)J	ND (12)J	ND (12)J	ND (11)J	ND (12)J
1,1,1-Trichloroethane		ND (11)	ND (12)	ND (12)	ND (11)	ND (12)
Carbon tetrachloride		ND (11)	ND (12)	ND (12)	ND (11)	ND (12)
Bromodichloromethane		ND (11)	ND (12)	ND (12)	ND (11)	ND (12)
1,2-Dichloropropane		ND (11)	ND (12)	ND (12)	ND (11)	ND (12)
cis-1,3-Dichloropropene		ND (11)	ND (12)	ND (12)	ND (11)	ND (12)
Trichloroethene		ND (11)	ND (12)	5J	ND (11)	ND (12)
Dibromochloromethane		ND (11)	ND (12)	ND (12)	ND (11)	ND (12)
1,1,2-Trichloroethane		ND (11)	ND (12)	ND (12)	ND (11)	ND (12)
Benzene		ND (11)	ND (12)	ND (12)	ND (11)	ND (12)
trans-1,3-Dichloropropene		ND (11)	ND (12)	ND (12)	ND (11)	ND (12)
Bromoform		ND (11)	ND (12)	ND (12)	ND (11)	ND (12)
4-Methyl-2-pentanone		ND (11)	ND (12)	ND (12)	ND (11)	ND (12)
2-Hexanone		ND (11)	ND (12)	ND (12)	ND (11)J	ND (12)
Tetrachloroethene		ND (11)	ND (12)	ND (12)	ND (11)	ND (12)
1,1,2,2-Tetrachloroethane		ND (11)J	ND (12)J	ND (12)J	ND (11)	ND (12)
Toluene		ND (11)	ND (12)	1J	ND (11)	ND (12)
Chlorobenzene		ND (11)	ND (12)	ND (12)	ND (11)	ND (12)
Ethylbenzene		ND (11)	ND (12)	ND (12)	ND (11)	ND (12)
Styrene		ND (11)	ND (12)	ND (12)	ND (11)	ND (12)
Xylene (total)		ND (11)	ND (12)	ND (12)	ND (11)	ND (12)
TCLP Volatiles (ug/L)						
Vinyl chloride		NA	NA	ND (10)	NA	NA
1,1-Dichloroethene		NA	NA	ND (10)	NA	NA
Chloroform		NA	NA	ND (10)	NA	NA
1,2-Dichloroethane		NA	NA	ND (10)	NA	NA
2-Butanone		NA	NA	ND (10)J	NA	NA
Carbon tetrachloride		NA	NA	ND (10)	NA	NA
Trichloroethene		NA	NA	ND (10)	NA	NA
Benzene		NA	NA	ND (10)	NA	NA
Tetrachloroethene		NA	NA	ND (10)	NA	NA
Chlorobenzene		NA	NA	ND (10)	NA	NA

TABLE A.2
SOIL SAMPLES
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
LEICA INC.
CHEEKTOWAGA, NEW YORK

Parameter	*Sample ID:*	*BH-D1-93*	*MW-14*	*MW-14*	*MW-5A-93*	*MW-5A-93*
	Depth:	*8.0 - 11.0 Ft.* *(Dup. of MW-13)*	*0.0-2.0 Ft.*	*10.0-11.0 Ft.*	*1.0-4.5 Ft.*	*8.0-11.8 Ft.*
	Collection date:	*12/08/93*	*12/06/93*	*12/06/93*	*12/01/93*	*12/01/93*
<u>*Semi-Volatiles (ug/kg)*</u>						
Phenol		NA	NA	ND (400)	NA	NA
bis(2-Chloroethyl)ether		NA	NA	ND (400)	NA	NA
2-Chlorophenol		NA	NA	ND (400)	NA	NA
1,3-Dichlorobenzene		NA	NA	ND (400)	NA	NA
1,4-Dichlorobenzene		NA	NA	ND (400)	NA	NA
1,2-Dichlorobenzene		NA	NA	ND (400)	NA	NA
2-Methylphenol		NA	NA	ND (400)	NA	NA
2,2'-oxybis(1-Chloropropane)		NA	NA	ND (400)	NA	NA
4-Methylphenol		NA	NA	ND (400)	NA	NA
N-Nitroso-di-n-propylamine		NA	NA	ND (400)	NA	NA
Hexachloroethane		NA	NA	ND (400)	NA	NA
Nitrobenzene		NA	NA	ND (400)	NA	NA
Isophorone		NA	NA	ND (400)	NA	NA
2-Nitrophenol		NA	NA	ND (400)	NA	NA
2,4-Dimethylphenol		NA	NA	ND (400)	NA	NA
bis(2-Chloroethoxy)methane		NA	NA	ND (400)	NA	NA
2,4-Dichlorophenol		NA	NA	ND (400)	NA	NA
1,2,4-Trichlorobenzene		NA	NA	ND (400)	NA	NA
Naphthalene		NA	NA	ND (400)	NA	NA
4-Chloroaniline		NA	NA	ND (400)	NA	NA
Hexachlorobutadiene		NA	NA	ND (400)	NA	NA
4-Chloro-3-methylphenol		NA	NA	ND (400)	NA	NA
2-Methylnaphthalene		NA	NA	ND (400)	NA	NA
Hexachlorocyclopentadiene		NA	NA	ND (400)	NA	NA
2,4,6-Trichlorophenol		NA	NA	ND (400)	NA	NA
2,4,5-Trichlorophenol		NA	NA	ND (1,000)	NA	NA
2-Chloronaphthalene		NA	NA	ND (400)	NA	NA
2-Nitroaniline		NA	NA	ND (1,000)	NA	NA
Dimethylphthalate		NA	NA	ND (400)	NA	NA
Acenaphthylene		NA	NA	ND (400)	NA	NA
2,6-Dinitrotoluene		NA	NA	ND (400)	NA	NA
3-Nitroaniline		NA	NA	ND (1,000)	NA	NA
Acenaphthene		NA	NA	ND (400)	NA	NA
2,4-Dinitrophenol		NA	NA	ND (1,000)J	NA	NA
4-Nitrophenol		NA	NA	ND (1,000)	NA	NA
Dibenzofuran		NA	NA	ND (400)	NA	NA
2,4-Dinitrotoluene		NA	NA	ND (400)	NA	NA
Diethylphthalate		NA	NA	ND (400)	NA	NA

TABLE A.2
SOIL SAMPLES
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
LEICA INC.
CHEEKTOWAGA, NEW YORK

Parameter	*Sample ID:*	*BH-D1-93*	*MW-14*	*MW-14*	*MW-5A-93*	*MW-5A-93*
	Depth:	*8.0 - 11.0 Ft.* *(Dup. of MW-13)*	*0.0-2.0 Ft.*	*10.0-11.0 Ft.*	*1.0-4.5 Ft.*	*8.0-11.8 Ft.*
	Collection date:	*12/08/93*	*12/06/93*	*12/06/93*	*12/01/93*	*12/01/93*
Semi-Volatiles (µg/kg) Cont'd.						
4-Chlorophenyl-phenylether		NA	NA	ND (400)	NA	NA
Fluorene		NA	NA	ND (400)	NA	NA
4-Nitroaniline		NA	NA	ND (1,000)J	NA	NA
4,6-Dinitro-2-methylphenol		NA	NA	ND (1,000)	NA	NA
N-Nitrosodiphenylamine(1)		NA	NA	ND (400)	NA	NA
4-Bromophenyl-phenylether		NA	NA	ND (400)	NA	NA
Hexachlorobenzene		NA	NA	ND (400)	NA	NA
Pentachlorophenol		NA	NA	ND (1,000)	NA	NA
Phenanthrene		NA	NA	ND (400)	NA	NA
Anthracene		NA	NA	ND (400)	NA	NA
Carbazole		NA	NA	ND (400)J	NA	NA
Di-n-butylphthalate		NA	NA	ND (400)	NA	NA
Fluoranthene		NA	NA	ND (400)	NA	NA
Pyrene		NA	NA	ND (400)	NA	NA
Butylbenzylphthalate		NA	NA	ND (400)	NA	NA
3,3'-Dichlorobenzidine		NA	NA	ND (400)	NA	NA
Benzo(a)anthracene		NA	NA	ND (400)	NA	NA
Chrysene		NA	NA	ND (400)	NA	NA
bis(2-Ethylhexyl)phthalate		NA	NA	ND (530)	NA	NA
Di-n-octylphthalate		NA	NA	ND (400)J	NA	NA
Benzo(b)fluoranthene		NA	NA	ND (400)J	NA	NA
Benzo(k)fluoranthene		NA	NA	ND (400)	NA	NA
Benzo(a)pyrene		NA	NA	ND (400)	NA	NA
Ideno(1,2,3-cd)pyrene		NA	NA	ND (400)	NA	NA
Dibenz(a,h)anthracene		NA	NA	ND (400)	NA	NA
Benzo(g,h,i)perylene		NA	NA	ND (400)	NA	NA
Petroleum Products (mg/kg)						
Gasoline		NA	NA	Not Present	NA	NA
Kerosene		NA	NA	ND (33)	NA	NA
Fuel oil		NA	NA	ND (33)	NA	NA
Lubricating oil		NA	NA	Present	NA	NA

TABLE A.2
SOIL SAMPLES
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
LEICA INC.
CHEEKTOWAGA, NEW YORK

Parameter	*Sample ID:*	*BH-D1-93*	*MW-14*	*MW-14*	*MW-5A-93*	*MW-5A-93*
	Depth:	*8.0 - 11.0 Ft.* *(Dup. of MW-13)*	*0.0-2.0 Ft.*	*10.0-11.0 Ft.*	*1.0-4.5 Ft.*	*8.0-11.8 Ft.*
	Collection date:	*12/08/93*	*12/06/93*	*12/06/93*	*12/01/93*	*12/01/93*
TCLP Semi-Volatiles (ug/L)						
1,4-Dichlorobenzene		NA	NA	ND (10)J	NA	NA
2-Methylphenol		NA	NA	ND (10)J	NA	NA
Hexachloroethane		NA	NA	ND (10)J	NA	NA
Nitrobenzene		NA	NA	ND (10)J	NA	NA
Hexachlorobutadiene		NA	NA	ND (10)J	NA	NA
2,4,6-Trichlorophenol		NA	NA	ND (10)J	NA	NA
2,4,5-Trichlorophenol		NA	NA	ND (26)J	NA	NA
2,4-Dinitrotoluene		NA	NA	ND (10)J	NA	NA
Hexachlorobenzene		NA	NA	ND (10)J	NA	NA
Pentachlorophenol		NA	NA	ND (26)J	NA	NA
Pyridine		NA	NA	ND (10)J	NA	NA
3/4-Methylphenol		NA	NA	-	NA	NA
3-Methylphenol		NA	NA	ND (10)J	NA	NA
4-Methylphenol		NA	NA	ND (10)J	NA	NA
Metals (mg/kg)						
Aluminum		2,580	15,200	4,100	9,540	5,800
Antimony		ND (1.8)	ND (2.1)	ND (2.0)	ND (1.9)	ND (1.9)
Arsenic		2.8J	4.6	1.7	5.9	1.5
Barium		26.3	167	37.9	40.4	43.3
Beryllium		ND (0.070)	0.68	ND (0.070)	ND (0.46)	ND (0.070)
Cadmium		ND (0.89)	2.9	ND (0.81)	1.5	ND (0.79)
Calcium		64,500	29,500	61,100	12,500	74,100
Chromium		7.5	35.4	7.4	12.4	9.6
Cobalt		2.5	10.9	3.4	7.3	4.8
Copper		6.2	33.1	10.0	29.6	10.9
Iron		8,500	26,900	9,240	20,000	11,200
Lead		5.3	346	6.3	9.6	6.8
Magnesium		25,800	12,500	25,300	3,750	29,700
Manganese		229	624	285	716	346
Mercury		ND (0.050)	0.37	ND (0.060)	ND (0.050)	ND (0.050)
Nickel		ND (4.6)	31.0	ND (6.4)	25.1	ND (9.7)
Potassium		666J	2,940	1,010	911	1,530
Selenium		ND (0.22)	ND (0.25)	ND (0.24)	ND (0.23)	ND (0.23)
Silver		ND (0.40)	ND (0.46)	ND (0.43)	ND (0.41)	ND (0.84)
Sodium		ND (128)	ND (113)	ND (161)	ND (196)	ND (209)
Thallium		ND (0.29)	0.35	ND (0.31)	0.39	ND (0.30)
Vanadium		10.9	33.1	10.4	20.4	13.6
Zinc		45.6	193	57.0	76.7	51.3

TABLE A.2
SOIL SAMPLES
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
LEICA INC.
CHEEKTOWAGA, NEW YORK

Parameter	*Sample ID:*	*BH-D1-93*	*MW-14*	*MW-14*	*MW-5A-93*	*MW-5A-93*
	Depth:	*8.0 - 11.0 Ft.* *(Dup. of MW-13)*	*0.0-2.0 Ft.*	*10.0-11.0 Ft.*	*1.0-4.5 Ft.*	*8.0-11.8 Ft.*
	Collection date:	*12/08/93*	*12/06/93*	*12/06/93*	*12/01/93*	*12/01/93*
TCLP Metals (µg/L)						
Arsenic		NA	NA	ND (41.5)	NA	NA
Barium		NA	NA	810	NA	NA
Cadmium		NA	NA	ND (3.3)	NA	NA
Chromium		NA	NA	ND (8.9)	NA	NA
Lead		NA	NA	ND (17.5)	NA	NA
Mercury		NA	NA	ND (0.10)	NA	NA
Selenium		NA	NA	ND (59.9)	NA	NA
Silver		NA	NA	ND (20)	NA	NA
Wet Chemistry (mg/kg)						
Total Organic Carbon		NA	NA	17,300	NA	NA
Total Petroleum Hydrocarbons		ND (34.6)	288	ND (37.7)	ND (35.7)	ND (36.4)

Notes:

D	Value quantitated from a dilution
Dup	Field Duplicate
J	Associated value is estimated
NA	Not analyzed
U	Non-detect at the associated value

TABLE A.3
SUPPLEMENTAL SOIL SAMPLES
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
LEICA INC.
CHEEKTOWAGA, NEW YORK

Parameter	*Sample ID:*	*BH-DS-E1*	*BH-DS-NW1* *(Dup. of BH-DS-E1)*	*BH-DS-E2*	*BH-DS-N1*
	Collection Date:	*04/07/94*	*04/07/94*	*04/07/94*	*04/07/94*
TCL Volatiles (µg/kg)					
Chloromethane		ND (12)	ND (12)	ND (11)	ND (12)
Bromomethane		ND (12)	ND (12)	ND (11)	ND (12)
Vinyl chloride		ND (12)	ND (12)	ND (11)	ND (12)
Chloroethane		ND (12)	ND (12)	ND (11)	ND (12)
Methylene chloride		ND (12)	ND (12)	ND (11)	ND (12)
Acetone		ND (12)	14U	ND (11)	ND (12)
Carbon disulfide		ND (12)J	ND (12)J	ND (11)J	ND (12)J
1,1-Dichloroethene		ND (12)	ND (12)	ND (11)	ND (12)
1,1-Dichloroethane		ND (12)	ND (12)	ND (11)	ND (12)
1,2-Dichloroethene (total)		ND (12)	ND (12)	ND (11)	4J
Chloroform		ND (12)	ND (12)	ND (11)	ND (12)
1,2-Dichloroethane		ND (12)	ND (12)	ND (11)	ND (12)
2-Butanone		2J	2J	ND (11)	ND (12)
1,1,1-Trichloroethane		ND (12)	ND (12)	ND (11)	ND (12)
Carbon tetrachloride		ND (12)	ND (12)	ND (11)	ND (12)
Bromodichloromethane		ND (12)	ND (12)	ND (11)	ND (12)
1,2-Dichloropropane		ND (12)	ND (12)	ND (11)	ND (12)
cis-1,3-Dichloropropene		ND (12)	ND (12)	ND (11)	ND (12)
Trichloroethene		ND (12)	ND (12)	ND (11)	6J
Dibromochloromethane		ND (12)	ND (12)	ND (11)	ND (12)
1,1,2-Trichloroethane		ND (12)	ND (12)	ND (11)	ND (12)
Benzene		ND (12)	ND (12)	ND (11)	ND (12)
trans-1,3-Dichloropropene		ND (12)	ND (12)	ND (11)	ND (12)
Bromoform		ND (12)	ND (12)	ND (11)	ND (12)
4-Methyl-2-pentanone		ND (12)	ND (12)	ND (11)	ND (12)
2-Hexanone		ND (12)	ND (12)	ND (11)	ND (12)
Tetrachloroethene		ND (12)	ND (12)	ND (11)	ND (12)
1,1,2,2-Tetrachloroethane		ND (12)	ND (12)	ND (11)	ND (12)
Toluene		ND (12)	ND (12)	ND (11)	ND (12)
Chlorobenzene		ND (12)	ND (12)	ND (11)	ND (12)
Ethylbenzene		ND (12)	ND (12)	ND (11)	ND (12)
Styrene		ND (12)	ND (12)	ND (11)	ND (12)
Xylene (total)		ND (12)	ND (12)	ND (11)	ND (12)
Wet Chemistry (mg/kg)					
Total Petroleum Hydrocarbons		4,170J	1,310J	2,010	3,930

Notes:

Dup.	Field duplicate.
J	The associated value is estimated.
NA	Not analyzed.
TCL	Target Compound List.

TABLE A.3
SUPPLEMENTAL SOIL SAMPLES
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
LEICA INC.
CHEEKTOWAGA, NEW YORK

Parameter	*Sample ID:*	*BH-DS-N2*	*BH-8-94*	*BH-10-94*	*BH-14A-94 (Dup. of BH-10-94)*
	Collection Date:	*04/07/94*	*04/07/94*	*04/08/94*	*04/08/94*
TCL Volatiles (µg/kg)					
Chloromethane		ND (12)	ND (13)	ND (11)	ND (11)
Bromomethane		ND (12)	ND (13)	ND (11)	ND (11)
Vinyl chloride		ND (12)	5J	ND (11)	ND (11)
Chloroethane		ND (12)	ND (13)	ND (11)	ND (11)
Methylene chloride		ND (12)	ND (13)	ND (11)	ND (11)
Acetone		ND (13)	ND (13)	ND (11)	6J
Carbon disulfide		ND (12)J	1J	ND (11)J	ND (11)
1,1-Dichloroethene		ND (12)	ND (13)	ND (11)	ND (11)
1,1-Dichloroethane		ND (12)	ND (13)	ND (11)	ND (11)
1,2-Dichloroethene (total)		1J	32	1J	ND (11)
Chloroform		ND (12)	ND (13)	ND (11)	ND (11)
1,2-Dichloroethane		ND (12)	ND (13)	ND (11)	ND (11)
2-Butanone		4J	1J	ND (11)	ND (11)
1,1,1-Trichloroethane		ND (12)	ND (13)	ND (11)	ND (11)
Carbon tetrachloride		ND (12)	ND (13)	ND (11)	ND (11)
Bromodichloromethane		ND (12)	ND (13)	ND (11)	ND (11)
1,2-Dichloropropane		ND (12)	ND (13)	ND (11)	ND (11)
cis-1,3-Dichloropropene		ND (12)	ND (13)	ND (11)	ND (11)
Trichloroethene		ND (12)	ND (13)	ND (11)	ND (11)
Dibromochloromethane		ND (12)	ND (13)	ND (11)	ND (11)
1,1,2-Trichloroethane		ND (12)	ND (13)	ND (11)	ND (11)
Benzene		ND (12)	20	2J	ND (11)
trans-1,3-Dichloropropene		ND (12)	ND (13)	ND (11)	ND (11)
Bromoform		ND (12)	ND (13)	ND (11)	ND (11)
4-Methyl-2-pentanone		ND (12)	ND (13)	ND (11)	ND (11)
2-Hexanone		ND (12)	ND (13)	ND (11)	ND (11)
Tetrachloroethene		ND (12)	ND (13)	ND (11)	ND (11)
1,1,2,2-Tetrachloroethane		ND (12)	ND (13)	ND (11)	ND (11)
Toluene		ND (12)	ND (13)	ND (11)	ND (11)
Chlorobenzene		ND (12)	ND (13)	23	17
Ethylbenzene		ND (12)	ND (13)	ND (11)	ND (11)
Styrene		ND (12)	ND (13)	ND (11)	ND (11)
Xylene (total)		ND (12)	1J	2J	1J
Wet Chemistry (mg/kg)					
Total Petroleum Hydrocarbons		2,200	ND (38.7)	ND (35.2)	ND (35.4)

Notes:

Dup.	Field duplicate.
J	The associated value is estimated.
NA	Not analyzed.
TCL	Target Compound List.

TABLE A.3
SUPPLEMENTAL SOIL SAMPLES
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
LEICA INC.
CHEEKTOWAGA, NEW YORK

Parameter	*Sample ID:*	*BH-11-94*	*MW-1A*	*MW-18*	*MW-19*	*MW-20*
	Collection Date:	*04/08/94*	*03/31/94*	*03/29/94*	*03/29/94*	*04/05/94*
TCL Volatiles (µg/kg)						
Chloromethane		ND (12)	ND (12)	ND (12)	ND (11)J	ND (11)
Bromomethane		ND (12)	ND (12)	ND (12)	ND (11)J	ND (11)
Vinyl chloride		3J	ND (12)J	ND (12)	ND (11)J	ND (11)
Chloroethane		ND (12)	ND (12)	ND (12)	ND (11)J	ND (11)
Methylene chloride		ND (12)	ND (12)	ND (12)	ND (11)J	ND (11)
Acetone		ND (12)	ND (12)J	ND (12)	ND (11)J	ND (11)
Carbon disulfide		ND (12)J	ND (12)J	ND (12)	ND (11)J	ND (11)
1,1-Dichloroethene		ND (12)	ND (12)	ND (12)	ND (11)J	ND (11)
1,1-Dichloroethane		ND (12)	ND (12)	ND (12)	ND (11)J	ND (11)
1,2-Dichloroethene (total)		3J	8J	ND (12)	8J	ND (11)
Chloroform		ND (12)	ND (12)	ND (12)	ND (11)J	ND (11)
1,2-Dichloroethane		ND (12)	ND (12)	ND (12)	ND (11)J	ND (11)
2-Butanone		ND (12)	ND (12)J	ND (12)J	ND (11)J	ND (11)J
1,1,1-Trichloroethane		ND (12)	ND (12)	ND (12)	ND (11)J	ND (11)
Carbon tetrachloride		ND (12)	ND (12)	ND (12)	ND (11)J	ND (11)
Bromodichloromethane		ND (12)	ND (12)	ND (12)	ND (11)J	ND (11)
1,2-Dichloropropane		ND (12)	ND (12)	ND (12)	ND (11)J	ND (11)
cis-1,3-Dichloropropene		ND (12)	ND (12)	ND (12)	ND (11)J	ND (11)
Trichloroethene		ND (12)	2J	ND (12)	ND (11)J	ND (11)
Dibromochloromethane		ND (12)	ND (12)	ND (12)	ND (11)J	ND (11)
1,1,2-Trichloroethane		ND (12)	ND (12)	ND (12)	ND (11)J	ND (11)
Benzene		ND (12)	ND (12)	ND (12)	ND (11)J	ND (11)
trans-1,3-Dichloropropene		ND (12)	ND (12)	ND (12)	ND (11)J	ND (11)
Bromoform		ND (12)	ND (12)J	ND (12)	ND (11)J	ND (11)
4-Methyl-2-pentanone		ND (12)	ND (12)J	ND (12)	ND (11)J	ND (11)
2-Hexanone		ND (12)	ND (12)J	ND (12)	ND (11)J	ND (11)
Tetrachloroethene		ND (12)	ND (12)	ND (12)	ND (11)J	ND (11)
1,1,2,2-Tetrachloroethane		ND (12)	ND (12)	ND (12)	ND (11)J	ND (11)
Toluene		ND (12)	ND (12)	ND (12)	ND (11)J	ND (11)
Chlorobenzene		ND (12)	ND (12)	ND (12)	ND (11)J	ND (11)
Ethylbenzene		ND (12)	ND (12)	ND (12)	ND (11)J	ND (11)
Styrene		ND (12)	ND (12)	ND (12)	ND (11)J	ND (11)
Xylene (total)		ND (12)	ND (12)	ND (12)	ND (11)J	ND (11)
Wet Chemistry (mg/kg)						
Total Petroleum Hydrocarbons		ND (35.7)	NA	NA	ND (35.9)	NA

Notes:

Dup.	Field duplicate.
J	The associated value is estimated.
NA	Not analyzed.
TCL	Target Compound List.

TABLE A.3
SUPPLEMENTAL SOIL SAMPLES
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
LEICA INC.
CHEEKTOWAGA, NEW YORK

Parameter *Sample ID:*	*MW-21*	*MW-22*	*MW-23*
Collection Date:	*04/04/94*	*03/29/94*	*03/29/94*
TCL Volatiles (µg/kg)			
Chloromethane	ND (11)	ND (11)	ND (11)
Bromomethane	ND (11)	ND (11)	ND (11)
Vinyl chloride	ND (11)	ND (11)	ND (11)
Chloroethane	ND (11)	ND (11)	ND (11)
Methylene chloride	ND (11)	2J	2J
Acetone	ND (11)	ND (11)	ND (11)
Carbon disulfide	ND (11)	ND (11)	ND (11)
1,1-Dichloroethene	ND (11)	ND (11)	ND (11)
1,1-Dichloroethane	ND (11)	ND (11)	ND (11)
1,2-Dichloroethene (total)	ND (11)	ND (11)	ND (11)
Chloroform	ND (11)	ND (11)	ND (11)
1,2-Dichloroethane	ND (11)	ND (11)	ND (11)
2-Butanone	ND (11)J	ND (11)J	ND (11)J
1,1,1-Trichloroethane	ND (11)	ND (11)	ND (11)
Carbon tetrachloride	ND (11)	ND (11)	ND (11)
Bromodichloromethane	ND (11)	ND (11)	ND (11)
1,2-Dichloropropane	ND (11)	ND (11)	ND (11)
cis-1,3-Dichloropropene	ND (11)	ND (11)	ND (11)
Trichloroethene	ND (11)	ND (11)	ND (11)
Dibromochloromethane	ND (11)	ND (11)	ND (11)
1,1,2-Trichloroethane	ND (11)	ND (11)	ND (11)
Benzene	ND (11)	ND (11)	ND (11)
trans-1,3-Dichloropropene	ND (11)	ND (11)	ND (11)
Bromoform	ND (11)	ND (11)	ND (11)
4-Methyl-2-pentanone	ND (11)	ND (11)	ND (11)
2-Hexanone	ND (11)	ND (11)	ND (11)
Tetrachloroethene	ND (11)	ND (11)	ND (11)
1,1,2,2-Tetrachloroethane	ND (11)	ND (11)	ND (11)
Toluene	120	ND (11)	ND (11)
Chlorobenzene	ND (11)	ND (11)	ND (11)
Ethylbenzene	ND (11)	ND (11)	ND (11)
Styrene	ND (11)	ND (11)	ND (11)
Xylene (total)	ND (11)	ND (11)	ND (11)
Wet Chemistry (mg/kg)			
Total Petroleum Hydrocarbons	NA	NA	NA

Notes:

Dup.	Field duplicate.
J	The associated value is estimated.
NA	Not analyzed.
TCL	Target Compound List.

TABLE A.4
GROUNDWATER SAMPLES - ROUND I
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
LEICA INC.
CHEEKTOWAGA, NEW YORK

		MW-1	*MW-2*	*MW-3*	*MW-4*	*MW-5*
	NYS SCG	*01/07/94*	*01/05/94*	*01/05/94*	*01/10/94*	*01/05/94*
Volatiles (µg/L)						
1,1,1-Trichloroethane	5 (S)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
1,1,2,2-Tetrachloroethane	5 (S)	ND (10)	ND (10)J	ND (10)J	ND (10)	ND (10)J
1,1,2-Trichloroethane	5 (S)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
1,1-Dichloroethane	5 (S)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
1,1-Dichloroethene	5 (S)	ND (10)	ND (10)	ND (10)	66	ND (10)
1,2-Dichloroethane	5 (S)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
1,2-Dichloroethene (total)	5 (S)	2J	2J	ND (10)	180,000D	6J
1,2-Dichloropropane	5 (S)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
2-Butanone	50 (G)	ND (10)	ND (10)J	ND (10)J	ND (10)	ND (10)J
2-Hexanone	50 (G)	ND (10)	ND (10)J	ND (10)J	ND (10)	ND (10)J
4-Methyl-2-pentanone	-	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Acetone	50 (G)	ND (10)	ND (10)J	ND (10)J	13	13J
Benzene	0.7 (S)	ND (10)	ND (10)	ND (10)	2J	ND (10)
Bromodichloromethane	50 (G)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Bromoform	50 (G)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Bromomethane	5 (S)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Carbon disulfide	-	ND (10)	ND (10)	ND (10)	3J	ND (10)
Carbon tetrachloride	5 (S)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Chlorobenzene	5 (S)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Chloroethane	5 (S)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Chloroform	7 (S)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Chloromethane	-	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
cis-1,3-Dichloropropene	5 (S)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Dibromochloromethane	50 (G)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Ethylbenzene	5 (S)	ND (10)	ND (10)	ND (10)	13	ND (10)
Methylene chloride	5 (S)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Styrene	5 (S)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Tetrachloroethene	5 (S)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Toluene	5 (S)	1J	ND (10)	ND (10)	ND (22)	ND (10)
trans-1,3-Dichloropropene	5 (S)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Trichloroethene	5 (S)	3J	39	ND (10)	110,000D	ND (10)
Vinyl chloride	2 (S)	ND (10)	ND (10)	ND (10)	28,000D	ND (10)
Xylene (total)	5 (S)	ND (10)	2J	2J	69	1J
Petroleum Products (µg/L)						
Gasoline	-	NA	NA	NA	NA	NA
Kerosene	-	NA	NA	NA	NA	NA
Fuel oil	-	NA	NA	NA	NA	NA
Lubricating oil	-	NA	NA	NA	NA	NA

TABLE A.4
GROUNDWATER SAMPLES - ROUND I
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
LEICA INC.
CHEEKTOWAGA, NEW YORK

	NYS SCG	*MW-1* *01/07/94*	*MW-2* *01/05/94*	*MW-3* *01/05/94*	*MW-4* *01/10/94*	*MW-5* *01/05/94*
Semi-Volatiles (µg/L)						
Phenol	-	NA	NA	NA	NA	NA
bis(2-Chloroethyl)ether	1.0 (S)	NA	NA	NA	NA	NA
2-Chlorophenol	-	NA	NA	NA	NA	NA
1,3-Dichlorobenzene	5 (S)	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	4.7 (S)	NA	NA	NA	NA	NA
1,2-Dichlorobenzene	4.7 (S)	NA	NA	NA	NA	NA
2-Methylphenol	-	NA	NA	NA	NA	NA
2,2'-oxybis(1-Chloropropane)	-	NA	NA	NA	NA	NA
4-Methylphenol	-	NA	NA	NA	NA	NA
N-Nitro-di-n-propylamine	-	NA	NA	NA	NA	NA
Hexachloroethane	-	NA	NA	NA	NA	NA
Nitrobenzene	5 (S)	NA	NA	NA	NA	NA
Isophorone	50 (G)	NA	NA	NA	NA	NA
2-Nitrophenol	-	NA	NA	NA	NA	NA
2,4-Dimethylphenol	-	NA	NA	NA	NA	NA
bis(2-Chloroethoxy)methane	-	NA	NA	NA	NA	NA
2,4-Dichlorophenol	-	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	5 (S)	NA	NA	NA	NA	NA
Naphthalene	10 (G)	NA	NA	NA	NA	NA
4-Chloroaniline	-	NA	NA	NA	NA	NA
Hexachlorobutadiene	5 (S)	NA	NA	NA	NA	NA
4-Chloro-3-methylphenol	-	NA	NA	NA	NA	NA
2-Methylnaphthalene	-	NA	NA	NA	NA	NA
Hexachlorocyclopentadiene	5 (S)	NA	NA	NA	NA	NA
2,4,6-Trichlorophenol	-	NA	NA	NA	NA	NA
2,4,5-Trichlorophenol	-	NA	NA	NA	NA	NA
2-Chloronaphthalene	10 (G)	NA	NA	NA	NA	NA
2-Nitroaniline	-	NA	NA	NA	NA	NA
Dimethylphthalate	50 (G)	NA	NA	NA	NA	NA
Acenaphthylene	-	NA	NA	NA	NA	NA
2,6-Dinitrotoluene	5 (S)	NA	NA	NA	NA	NA
3-Nitroaniline	-	NA	NA	NA	NA	NA
Acenaphthene	20 (G)	NA	NA	NA	NA	NA
2,4-Dinitrophenol	-	NA	NA	NA	NA	NA
4-Nitrophenol	-	NA	NA	NA	NA	NA
Dibenzofuran	-	NA	NA	NA	NA	NA
2,4-Dinitrotoluene	-	NA	NA	NA	NA	NA
Diethylphthalate	50 (G)	NA	NA	NA	NA	NA

TABLE A.4
GROUNDWATER SAMPLES - ROUND I
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
LEICA INC.
CHEEKTOWAGA, NEW YORK

	NYS SCG	*MW-1* *01/07/94*	*MW-2* *01/05/94*	*MW-3* *01/05/94*	*MW-4* *01/10/94*	*MW-5* *01/05/94*
Semi-Volatiles (µg/L) (cont'd.)						
4-Chlorophenyl-phenylether	-	NA	NA	NA	NA	NA
Fluorene	50 (G)	NA	NA	NA	NA	NA
4-Nitroaniline	-	NA	NA	NA	NA	NA
4,6-Dinitro-2-methylphenol	-	NA	NA	NA	NA	NA
N-Nitrosodiphenylamine(1)	50 (G)	NA	NA	NA	NA	NA
4-Bromophenyl-phenylether	-	NA	NA	NA	NA	NA
Hexachlorobenzene	0.35 (S)	NA	NA	NA	NA	NA
Pentachlorophenol	-	NA	NA	NA	NA	NA
Phenanthrene	50 (G)	NA	NA	NA	NA	NA
Anthracene	50 (G)	NA	NA	NA	NA	NA
Carbazole	-	NA	NA	NA	NA	NA
Di-n-butylphthalate	50 (S)	NA	NA	NA	NA	NA
Fluoranthene	50 (G)	NA	NA	NA	NA	NA
Pyrene	50 (G)	NA	NA	NA	NA	NA
Butylbenzylphthalate	50 (G)	NA	NA	NA	NA	NA
3,3'-Dichlorobenzidine	-	NA	NA	NA	NA	NA
Benzo(a)anthracene	0.002 (G)	NA	NA	NA	NA	NA
Chrysene	0.002 (G)	NA	NA	NA	NA	NA
bis(2-Ethylhexyl)phthalate	50 (S)	NA	NA	NA	NA	NA
Di-n-octylphthalate	50 (G)	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	0.002 (G)	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	0.002 (G)	NA	NA	NA	NA	NA
Benzo(a)pyrene	0.002 (G)	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	0.002 (G)	NA	NA	NA	NA	NA
Dibenzo(a,h)anthracene	-	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	-	NA	NA	NA	NA	NA
Metals (µg/L)						
Aluminum	-	NA	NA	NA	NA	NA
Antimony	3 (G)	NA	NA	NA	NA	NA
Arsenic	25 (S)	NA	NA	NA	NA	NA
Barium	1,000 (S)	NA	NA	NA	NA	NA
Beryllium	3 (G)	NA	NA	NA	NA	NA
Cadmium	10 (S)	NA	NA	NA	NA	NA
Calcium	-	NA	NA	NA	NA	NA
Chromium	50 (S)	NA	NA	NA	NA	NA
Cobalt	-	NA	NA	NA	NA	NA
Copper	200 (S)	NA	NA	NA	NA	NA
Iron	300 (S) *	NA	NA	NA	NA	NA
Lead	25 (S)	NA	NA	NA	NA	NA
Magnesium	35,000 (G)	NA	NA	NA	NA	NA
Manganese	300 (S) *	NA	NA	NA	NA	NA
Mercury	2 (S)	NA	NA	NA	NA	NA
Nickel	-	NA	NA	NA	NA	NA
Potassium	-	NA	NA	NA	NA	NA

TABLE A.4
GROUNDWATER SAMPLES - ROUND I
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
LEICA INC.
CHEEKTOWAGA, NEW YORK

	NYS SCG	*MW-1* *01/07/94*	*MW-2* *01/05/94*	*MW-3* *01/05/94*	*MW-4* *01/10/94*	*MW-5* *01/05/94*
Metals (µg/L) Cont'd.						
Selenium	10 (S)	NA	NA	NA	NA	NA
Silver	50 (S)	NA	NA	NA	NA	NA
Sodium	20,000 (S)	NA	NA	NA	NA	NA
Thallium	4 (G)	NA	NA	NA	NA	NA
Vanadium	-	NA	NA	NA	NA	NA
Zinc	300 (S)	NA	NA	NA	NA	NA
Wet Chemistry (mg/L)						
Total Petroleum Hydrocarbons	-	ND (2.5)	ND (2.5)	ND (2.5)	ND (2.5)	ND (2.5)

Notes:

(G)	Guidance value
(S)	Standard value
*	Manganese and iron < 500 µg/L
-	Not Available
APL	Aqueous Phase Liquid
D	Value quantitated from a dilution
Dup	Field Duplicate
J	Associated value is estimated
NA	Not analyzed
NAPL	Non-Aqueous Phase Liquid
R	Rejected value
U	Non-detect at the associated value

TABLE A.4
GROUNDWATER SAMPLES - ROUND I
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
LEICA INC.
CHEEKTOWAGA, NEW YORK

		MW-6	*MW-7*	*MW-8*	*MW-8*	*MW-9*
	NYS SCG	*01/05/94*	*01/07/94*	*01/11/94*	*01/11/94*	*01/07/94*
Volatiles (µg/L)						
1,1,1-Trichloroethane	5 (S)	ND (10)	ND (1,000)	ND (10)J	ND (10)J	ND (10)
1,1,2,2-Tetrachloroethane	5 (S)	ND (10)J	ND (1,000)	R	R	ND (10)
1,1,2-Trichloroethane	5 (S)	ND (10)	ND (1,000)	ND (10)J	ND (10)J	ND (10)
1,1-Dichloroethane	5 (S)	ND (10)	ND (1,000)	R	ND (10)J	ND (10)
1,1-Dichloroethene	5 (S)	22	ND (1,000)	ND (50,000)D	ND (50,000)D	ND (10)
1,2-Dichloroethane	5 (S)	ND (10)	ND (1,000)	R	ND (10)J	ND (10)
1,2-Dichloroethene (total)	5 (S)	4,000D	6,500	370,000D	390,000D	63
1,2-Dichloropropane	5 (S)	ND (10)	ND (1,000)	ND (10)J	ND (10)J	ND (10)
2-Butanone	50 (G)	ND (10)	ND (1,000)	R	ND (10)J	ND (10)
2-Hexanone	50 (G)	ND (10)	ND (1,000)	R	R	ND (10)
4-Methyl-2-pentanone	-	ND (10)J	ND (1,000)	R	R	ND (10)
Acetone	50 (G)	ND (10)	ND (1,000)	ND (50,000)DJ	ND (50,000)DJ	ND (10)
Benzene	0.7 (S)	4J	190J	8J	7J	ND (10)
Bromodichloromethane	50 (G)	ND (10)	ND (1,000)	ND (10)J	ND (10)J	ND (10)
Bromoform	50 (G)	ND (10)	ND (1,000)	ND (10)J	ND (10)J	ND (10)
Bromomethane	5 (S)	ND (10)	ND (1,000)	R	ND (10)J	ND (10)
Carbon disulfide	-	ND (10)	ND (1,000)	R	ND (10)J	ND (10)
Carbon tetrachloride	5 (S)	ND (10)	ND (1,000)	ND (10)J	ND (10)J	ND (10)
Chlorobenzene	5 (S)	ND (10)	ND (1,000)	R	R	ND (10)
Chloroethane	5 (S)	ND (10)	ND (1,000)	R	ND (10)J	ND (10)
Chloroform	7 (S)	ND (10)	ND (1,000)	R	ND (10)J	ND (10)
Chloromethane	-	ND (10)	ND (1,000)	R	ND (10)J	ND (10)
cis-1,3-Dichloropropene	5 (S)	ND (10)	ND (1,000)	ND (10)J	ND (10)J	ND (10)
Dibromochloromethane	50 (G)	ND (10)	ND (1,000)	ND (10)J	ND (10)J	ND (10)
Ethylbenzene	5 (S)	ND (10)	120J	130J	84J	ND (10)
Methylene chloride	5 (S)	ND (10)	ND (1,000)	R	ND (10)J	ND (10)
Styrene	5 (S)	ND (10)	ND (1,000)	R	R	ND (10)
Tetrachloroethene	5 (S)	ND (10)	ND (1,000)	R	23J	ND (10)
Toluene	5 (S)	3J	210J	ND (50,000)D	ND (50,000)D	1J
trans-1,3-Dichloropropene	5 (S)	ND (10)	ND (1,000)	ND (10)J	ND (10)J	ND (10)
Trichloroethene	5 (S)	890D	ND (1,000)	71,000D	36,000DJ	2J
Vinyl chloride	2 (S)	450JD	4,400D	54,000DJ	54,000DJ	140
Xylene (total)	5 (S)	ND (10)	240J	21,000JD	ND (50,000)D	3J
Petroleum Products (µg/L)						
Gasoline	-	NA	NA	NA	NA	NA
Kerosene	-	NA	NA	NA	NA	NA
Fuel oil	-	NA	NA	NA	NA	NA
Lubricating oil	-	NA	NA	NA	NA	NA

TABLE A.4
GROUNDWATER SAMPLES - ROUND I
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
LEICA INC.
CHEEKTOWAGA, NEW YORK

	NYS SCG	*MW-6* *01/05/94*	*MW-7* *01/07/94*	*MW-8* *01/11/94*	*MW-8* *01/11/94*	*MW-9* *01/07/94*
Semi-Volatiles (μg/L)						
Phenol	-	NA	NA	NA	NA	NA
bis(2-Chloroethyl)ether	1.0 (S)	NA	NA	NA	NA	NA
2-Chlorophenol	-	NA	NA	NA	NA	NA
1,3-Dichlorobenzene	5 (S)	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	4.7 (S)	NA	NA	NA	NA	NA
1,2-Dichlorobenzene	4.7 (S)	NA	NA	NA	NA	NA
2-Methylphenol	-	NA	NA	NA	NA	NA
2,2'-oxybis(1-Chloropropane)	-	NA	NA	NA	NA	NA
4-Methylphenol	-	NA	NA	NA	NA	NA
N-Nitro-di-n-propylamine	-	NA	NA	NA	NA	NA
Hexachloroethane	-	NA	NA	NA	NA	NA
Nitrobenzene	5 (S)	NA	NA	NA	NA	NA
Isophorone	50 (G)	NA	NA	NA	NA	NA
2-Nitrophenol	-	NA	NA	NA	NA	NA
2,4-Dimethylphenol	-	NA	NA	NA	NA	NA
bis(2-Chloroethoxy)methane	-	NA	NA	NA	NA	NA
2,4-Dichlorophenol	-	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	5 (S)	NA	NA	NA	NA	NA
Naphthalene	10 (G)	NA	NA	NA	NA	NA
4-Chloroaniline	-	NA	NA	NA	NA	NA
Hexachlorobutadiene	5 (S)	NA	NA	NA	NA	NA
4-Chloro-3-methylphenol	-	NA	NA	NA	NA	NA
2-Methylnaphthalene	-	NA	NA	NA	NA	NA
Hexachlorocyclopentadiene	5 (S)	NA	NA	NA	NA	NA
2,4,6-Trichlorophenol	-	NA	NA	NA	NA	NA
2,4,5-Trichlorophenol	-	NA	NA	NA	NA	NA
2-Chloronaphthalene	10 (G)	NA	NA	NA	NA	NA
2-Nitroaniline	-	NA	NA	NA	NA	NA
Dimethylphthalate	50 (G)	NA	NA	NA	NA	NA
Acenaphthylene	-	NA	NA	NA	NA	NA
2,6-Dinitrotoluene	5 (S)	NA	NA	NA	NA	NA
3-Nitroaniline	-	NA	NA	NA	NA	NA
Acenaphthene	20 (G)	NA	NA	NA	NA	NA
2,4-Dinitrophenol	-	NA	NA	NA	NA	NA
4-Nitrophenol	-	NA	NA	NA	NA	NA
Dibenzofuran	-	NA	NA	NA	NA	NA
2,4-Dinitrotoluene	-	NA	NA	NA	NA	NA
Diethylphthalate	50 (G)	NA	NA	NA	NA	NA

TABLE A.4
GROUNDWATER SAMPLES - ROUND I
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
LEICA INC.
CHEEKTOWAGA, NEW YORK

	NYS SCG	*MW-6* *01/05/94*	*MW-7* *01/07/94*	*MW-8* *01/11/94*	*MW-8* *01/11/94*	*MW-9* *01/07/94*
Semi-Volatiles (µg/L) (cont'd.)						
4-Chlorophenyl-phenylether	-	NA	NA	NA	NA	NA
Fluorene	50 (G)	NA	NA	NA	NA	NA
4-Nitroaniline	-	NA	NA	NA	NA	NA
4,6-Dinitro-2-methylphenol	-	NA	NA	NA	NA	NA
N-Nitrosodiphenylamine(1)	50 (G)	NA	NA	NA	NA	NA
4-Bromophenyl-phenylether	-	NA	NA	NA	NA	NA
Hexachlorobenzene	0.35 (S)	NA	NA	NA	NA	NA
Pentachlorophenol	-	NA	NA	NA	NA	NA
Phenanthrene	50 (G)	NA	NA	NA	NA	NA
Anthracene	50 (G)	NA	NA	NA	NA	NA
Carbazole	-	NA	NA	NA	NA	NA
Di-n-butylphthalate	50 (S)	NA	NA	NA	NA	NA
Fluoranthene	50 (G)	NA	NA	NA	NA	NA
Pyrene	50 (G)	NA	NA	NA	NA	NA
Butylbenzylphthalate	50 (G)	NA	NA	NA	NA	NA
3,3'-Dichlorobenzidine	-	NA	NA	NA	NA	NA
Benzo(a)anthracene	0.002 (G)	NA	NA	NA	NA	NA
Chrysene	0.002 (G)	NA	NA	NA	NA	NA
bis(2-Ethylhexyl)phthalate	50 (S)	NA	NA	NA	NA	NA
Di-n-octylphthalate	50 (G)	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	0.002 (G)	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	0.002 (G)	NA	NA	NA	NA	NA
Benzo(a)pyrene	0.002 (G)	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	0.002 (G)	NA	NA	NA	NA	NA
Dibenzo(a,h)anthracene	-	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	-	NA	NA	NA	NA	NA
Metals (µg/L)						
Aluminum	-	NA	NA	NA	NA	NA
Antimony	3 (G)	NA	NA	NA	NA	NA
Arsenic	25 (S)	NA	NA	NA	NA	NA
Barium	1,000 (S)	NA	NA	NA	NA	NA
Beryllium	3 (G)	NA	NA	NA	NA	NA
Cadmium	10 (S)	NA	NA	NA	NA	NA
Calcium	-	NA	NA	NA	NA	NA
Chromium	50 (S)	NA	NA	NA	NA	NA
Cobalt	-	NA	NA	NA	NA	NA
Copper	200 (S)	NA	NA	NA	NA	NA
Iron	300 (S) *	NA	NA	NA	NA	NA
Lead	25 (S)	NA	NA	NA	NA	NA
Magnesium	35,000 (G)	NA	NA	NA	NA	NA
Manganese	300 (S) *	NA	NA	NA	NA	NA
Mercury	2 (S)	NA	NA	NA	NA	NA
Nickel	-	NA	NA	NA	NA	NA
Potassium	-	NA	NA	NA	NA	NA

TABLE A.4
GROUNDWATER SAMPLES - ROUND I
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
LEICA INC.
CHEEKTOWAGA, NEW YORK

	NYS SCG	*MW-6* *01/05/94*	*MW-7* *01/07/94*	*MW-8* *01/11/94*	*MW-8* *01/11/94*	*MW-9* *01/07/94*
Metals (µg/L) Cont'd.						
Selenium	10 (S)	NA	NA	NA	NA	NA
Silver	50 (S)	NA	NA	NA	NA	NA
Sodium	20,000 (S)	NA	NA	NA	NA	NA
Thallium	4 (G)	NA	NA	NA	NA	NA
Vanadium	-	NA	NA	NA	NA	NA
Zinc	300 (S)	NA	NA	NA	NA	NA
Wet Chemistry (mg/L)						
Total Petroleum Hydrocarbons	-	ND (2.5)	ND (2.5)	67.4	NA	ND (2.5)

Notes:

(G)	Guidance value
(S)	Standard value
*	Manganese and iron < 500 µg/L
-	Not Available
APL	Aqueous Phase Liquid
D	Value quantitated from a dilution
Dup	Field Duplicate
J	Associated value is estimated
NA	Not analyzed
NAPL	Non-Aqueous Phase Liquid
R	Rejected value
U	Non-detect at the associated value

TABLE A.4
GROUNDWATER SAMPLES - ROUND I
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
LEICA INC.
CHEEKTOWAGA, NEW YORK

		MW-10	*MW-19C*	*MW-11*	*MW-11-NAPL*	*MW-12*
	NYS SCG	*01/11/94*	*01/11/94*	*01/10/94*	*01/10/94*	*01/10/94*
Volatiles (µg/L)						
1,1,1-Trichloroethane	5 (S)	ND (10)J	ND (10)J	R	ND (1,000,000)	ND (10)J
1,1,2,2-Tetrachloroethane	5 (S)	ND (10)J	ND (10)J	R	ND (1,000,000)J	ND (10)J
1,1,2-Trichloroethane	5 (S)	ND (10)J	ND (10)J	R	ND (1,000,000)	ND (10)J
1,1-Dichloroethane	5 (S)	ND (10)J	ND (10)J	R	ND (1,000,000)	ND (10)J
1,1-Dichloroethene	5 (S)	160J	180J	ND (50,000)D	ND (1,000,000)	ND (10)J
1,2-Dichloroethane	5 (S)	ND (10)J	ND (10)J	R	ND (1,000,000)	ND (10)J
1,2-Dichloroethene (total)	5 (S)	51,000DJ	90,000DJ	470,000D	22,000,000	53,000D
1,2-Dichloropropane	5 (S)	ND (10)J	ND (10)J	R	ND (1,000,000)	ND (10)J
2-Butanone	50 (G)	ND (10)J	ND (10)J	R	ND (1,000,000)	ND (10)J
2-Hexanone	50 (G)	ND (10)J	ND (10)J	R	ND (1,000,000)	ND (10)J
4-Methyl-2-pentanone	-	ND (10)J	ND (10)J	R	ND (1,000,000)	ND (10)J
Acetone	50 (G)	18U	ND (10)J	ND (50,000)DJ	ND (1,000,000)	ND (10)J
Benzene	0.7 (S)	ND (10)J	ND (10)J	R	ND (1,000,000)	ND (10)J
Bromodichloromethane	50 (G)	ND (10)J	ND (10)J	R	ND (1,000,000)	ND (10)J
Bromoform	50 (G)	ND (10)J	ND (10)J	R	ND (1,000,000)	ND (10)J
Bromomethane	5 (S)	ND (10)J	ND (10)J	R	ND (1,000,000)	ND (10)J
Carbon disulfide	-	ND (10)J	ND (10)J	R	ND (1,000,000)	ND (10)J
Carbon tetrachloride	5 (S)	ND (10)J	ND (10)J	R	ND (1,000,000)	ND (10)J
Chlorobenzene	5 (S)	ND (10)J	ND (10)J	R	ND (1,000,000)	ND (10)J
Chloroethane	5 (S)	ND (10)J	ND (10)J	R	ND (1,000,000)	ND (10)J
Chloroform	7 (S)	ND (10)J	ND (10)J	R	ND (1,000,000)	ND (10)J
Chloromethane	-	ND (10)J	ND (10)J	R	ND (1,000,000)	ND (10)J
cis-1,3-Dichloropropene	5 (S)	ND (10)J	ND (10)J	R	ND (1,000,000)	ND (10)J
Dibromochloromethane	50 (G)	ND (10)J	ND (10)J	R	ND (1,000,000)	ND (10)J
Ethylbenzene	5 (S)	17J	19J	ND (50,000)D	920,000J	17J
Methylene chloride	5 (S)	ND (10)J	ND (10)J	120J	ND (1,000,000)	ND (10)J
Styrene	5 (S)	ND (10)J	ND (10)J	R	ND (1,000,000)	ND (10)J
Tetrachloroethene	5 (S)	ND (10)J	ND (10)J	50J	160,000J	ND (10)J
Toluene	5 (S)	49J	54J	ND (50,000)D	ND (1,000,000)	69J
trans-1,3-Dichloropropene	5 (S)	ND (10)J	ND (10)J	R	ND (1,000,000)	ND (10)J
Trichloroethene	5 (S)	ND (50,000)DJ	38,000JD	250,000D	330,000,000D	86,000D
Vinyl chloride	2 (S)	ND (50,000)DJ	15,700JD	48,000JD	1,400,000	ND (10)J
Xylene (total)	5 (S)	100J	100J	ND (50,000)D	6,600,000	140J
Petroleum Products (µg/L)						
Gasoline	-	Not Present	NA	NA	NA	NA
Kerosene	-	100U	NA	NA	NA	NA
Fuel oil	-	590	NA	NA	NA	NA
Lubricating oil	-	Present	NA	NA	NA	NA

TABLE A.4
GROUNDWATER SAMPLES - ROUND I
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
LEICA INC.
CHEEKTOWAGA, NEW YORK

	NYS SCG	*MW-10* *01/11/94*	*MW-19C* *01/11/94*	*MW-11* *01/10/94*	*MW-11-NAPL* *01/10/94*	*MW-12* *01/10/94*
Semi-Volatiles (µg/L)						
Phenol	-	NA	NA	NA	NA	NA
bis(2-Chloroethyl)ether	1.0 (S)	NA	NA	NA	NA	NA
2-Chlorophenol	-	NA	NA	NA	NA	NA
1,3-Dichlorobenzene	5 (S)	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	4.7 (S)	NA	NA	NA	NA	NA
1,2-Dichlorobenzene	4.7 (S)	NA	NA	NA	NA	NA
2-Methylphenol	-	NA	NA	NA	NA	NA
2,2'-oxybis(1-Chloropropane)	-	NA	NA	NA	NA	NA
4-Methylphenol	-	NA	NA	NA	NA	NA
N-Nitro-di-n-propylamine	-	NA	NA	NA	NA	NA
Hexachloroethane	-	NA	NA	NA	NA	NA
Nitrobenzene	5 (S)	NA	NA	NA	NA	NA
Isophorone	50 (G)	NA	NA	NA	NA	NA
2-Nitrophenol	-	NA	NA	NA	NA	NA
2,4-Dimethylphenol	-	NA	NA	NA	NA	NA
bis(2-Chloroethoxy)methane	-	NA	NA	NA	NA	NA
2,4-Dichlorophenol	-	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	5 (S)	NA	NA	NA	NA	NA
Naphthalene	10 (G)	NA	NA	NA	NA	NA
4-Chloroaniline	-	NA	NA	NA	NA	NA
Hexachlorobutadiene	5 (S)	NA	NA	NA	NA	NA
4-Chloro-3-methylphenol	-	NA	NA	NA	NA	NA
2-Methylnaphthalene	-	NA	NA	NA	NA	NA
Hexachlorocyclopentadiene	5 (S)	NA	NA	NA	NA	NA
2,4,6-Trichlorophenol	-	NA	NA	NA	NA	NA
2,4,5-Trichlorophenol	-	NA	NA	NA	NA	NA
2-Chloronaphthalene	10 (G)	NA	NA	NA	NA	NA
2-Nitroaniline	-	NA	NA	NA	NA	NA
Dimethylphthalate	50 (G)	NA	NA	NA	NA	NA
Acenaphthylene	-	NA	NA	NA	NA	NA
2,6-Dinitrotoluene	5 (S)	NA	NA	NA	NA	NA
3-Nitroaniline	-	NA	NA	NA	NA	NA
Acenaphthene	20 (G)	NA	NA	NA	NA	NA
2,4-Dinitrophenol	-	NA	NA	NA	NA	NA
4-Nitrophenol	-	NA	NA	NA	NA	NA
Dibenzofuran	-	NA	NA	NA	NA	NA
2,4-Dinitrotoluene	-	NA	NA	NA	NA	NA
Diethylphthalate	50 (G)	NA	NA	NA	NA	NA

TABLE A.4
GROUNDWATER SAMPLES - ROUND I
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
LEICA INC.
CHEEKTOWAGA, NEW YORK

	NYS SCG	*MW-10* *01/11/94*	*MW-19C* *01/11/94*	*MW-11* *01/10/94*	*MW-11-NAPL* *01/10/94*	*MW-12* *01/10/94*
Semi-Volatiles (µg/L) (cont'd.)						
4-Chlorophenyl-phenylether	-	NA	NA	NA	NA	NA
Fluorene	50 (G)	NA	NA	NA	NA	NA
4-Nitroaniline	-	NA	NA	NA	NA	NA
4,6-Dinitro-2-methylphenol	-	NA	NA	NA	NA	NA
N-Nitrosodiphenylamine(1)	50 (G)	NA	NA	NA	NA	NA
4-Bromophenyl-phenylether	-	NA	NA	NA	NA	NA
Hexachlorobenzene	0.35 (S)	NA	NA	NA	NA	NA
Pentachlorophenol	-	NA	NA	NA	NA	NA
Phenanthrene	50 (G)	NA	NA	NA	NA	NA
Anthracene	50 (G)	NA	NA	NA	NA	NA
Carbazole	-	NA	NA	NA	NA	NA
Di-n-butylphthalate	50 (S)	NA	NA	NA	NA	NA
Fluoranthene	50 (G)	NA	NA	NA	NA	NA
Pyrene	50 (G)	NA	NA	NA	NA	NA
Butylbenzylphthalate	50 (G)	NA	NA	NA	NA	NA
3,3'-Dichlorobenzidine	-	NA	NA	NA	NA	NA
Benzo(a)anthracene	0.002 (G)	NA	NA	NA	NA	NA
Chrysene	0.002 (G)	NA	NA	NA	NA	NA
bis(2-Ethylhexyl)phthalate	50 (S)	NA	NA	NA	NA	NA
Di-n-octylphthalate	50 (G)	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	0.002 (G)	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	0.002 (G)	NA	NA	NA	NA	NA
Benzo(a)pyrene	0.002 (G)	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	0.002 (G)	NA	NA	NA	NA	NA
Dibenzo(a,h)anthracene	-	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	-	NA	NA	NA	NA	NA
Metals (µg/L)						
Aluminum	-	NA	NA	NA	NA	NA
Antimony	3 (G)	NA	NA	NA	NA	NA
Arsenic	25 (S)	NA	NA	NA	NA	NA
Barium	1,000 (S)	NA	NA	NA	NA	NA
Beryllium	3 (G)	NA	NA	NA	NA	NA
Cadmium	10 (S)	NA	NA	NA	NA	NA
Calcium	-	NA	NA	NA	NA	NA
Chromium	50 (S)	NA	NA	NA	NA	NA
Cobalt	-	NA	NA	NA	NA	NA
Copper	200 (S)	NA	NA	NA	NA	NA
Iron	300 (S) *	NA	NA	NA	NA	NA
Lead	25 (S)	NA	NA	NA	NA	NA
Magnesium	35,000 (G)	NA	NA	NA	NA	NA
Manganese	300 (S) *	NA	NA	NA	NA	NA
Mercury	2 (S)	NA	NA	NA	NA	NA
Nickel	-	NA	NA	NA	NA	NA
Potassium	-	NA	NA	NA	NA	NA

TABLE A.4
GROUNDWATER SAMPLES - ROUND I
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
LEICA INC.
CHEEKTOWAGA, NEW YORK

	NYS SCG	MW-10 01/11/94	MW-19C 01/11/94	MW-11 01/10/94	MW-11-NAPL 01/10/94	MW-12 01/10/94
Metals (µg/L) Cont'd.						
Selenium	10 (S)	NA	NA	NA	NA	NA
Silver	50 (S)	NA	NA	NA	NA	NA
Sodium	20,000 (S)	NA	NA	NA	NA	NA
Thallium	4 (G)	NA	NA	NA	NA	NA
Vanadium	-	NA	NA	NA	NA	NA
Zinc	300 (S)	NA	NA	NA	NA	NA
Wet Chemistry (mg/L)						
Total Petroleum Hydrocarbons	-	3.2	ND (2.5)J	192.00	NA	ND (2.5)J

Notes:

(G)	Guidance value
(S)	Standard value
*	Manganese and iron < 500 µg/L
-	Not Available
APL	Aqueous Phase Liquid
D	Value quantitated from a dilution
Dup	Field Duplicate
J	Associated value is estimated
NA	Not analyzed
NAPL	Non-Aqueous Phase Liquid
R	Rejected value
U	Non-detect at the associated value

TABLE A.4
GROUNDWATER SAMPLES - ROUND I
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
LEICA INC.
CHEEKTOWAGA, NEW YORK

	NYS SCG	*MW-13* *01/06/94*	*MW-14* *01/06/94*	*MW-18C* *01/06/94*	*MW-15* *01/06/94*	*MW-16* *01/07/94*
Volatiles (µg/L)						
1,1,1-Trichloroethane	5 (S)	ND (10)	ND (10)	ND (10)	ND (10)	87J
1,1,2,2-Tetrachloroethane	5 (S)	ND (10)J	ND (10)J	ND (10)J	ND (10)J	ND (10)J
1,1,2-Trichloroethane	5 (S)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
1,1-Dichloroethane	5 (S)	ND (10)	ND (10)	ND (10)	14	6,500D
1,1-Dichloroethene	5 (S)	ND (10)	ND (10)	ND (10)	ND (10)	630JD
1,2-Dichloroethane	5 (S)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
1,2-Dichloroethene (total)	5 (S)	2J	580D	650D	3J	8,200D
1,2-Dichloropropane	5 (S)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
2-Butanone	50 (G)	ND (10)	ND (10)J	ND (10)J	ND (10)	ND (10)
2-Hexanone	50 (G)	ND (10)J	ND (10)J	ND (10)J	ND (10)	ND (10)
4-Methyl-2-pentanone	-	ND (10)J	ND (10)	ND (10)	ND (10)J	ND (10)J
Acetone	50 (G)	ND (14)	ND (10)	ND (10)	74	ND (10)
Benzene	0.7 (S)	ND (10)	2J	1J	ND (10)	1J
Bromodichloromethane	50 (G)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Bromoform	50 (G)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Bromomethane	5 (S)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Carbon disulfide	-	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Carbon tetrachloride	5 (S)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Chlorobenzene	5 (S)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Chloroethane	5 (S)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Chloroform	7 (S)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Chloromethane	-	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
cis-1,3-Dichloropropene	5 (S)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Dibromochloromethane	50 (G)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Ethylbenzene	5 (S)	ND (10)	ND (10)	ND (10)	ND (10)	2,000D
Methylene chloride	5 (S)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Styrene	5 (S)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Tetrachloroethene	5 (S)	ND (10)	ND (10)	ND (10)	ND (10)	3J
Toluene	5 (S)	ND (10)	ND (10)	ND (10)	1J	1,100JD
trans-1,3-Dichloropropene	5 (S)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Trichloroethene	5 (S)	ND (10)	ND (10)	ND (10)	ND (10)	6,800D
Vinyl chloride	2 (S)	ND (10)	8J	8J	ND (10)	75J
Xylene (total)	5 (S)	ND (10)	ND (10)	ND (10)	1J	5,200D
Petroleum Products (µg/L)						
Gasoline	-	NA	NA	NA	NA	NA
Kerosene	-	NA	NA	NA	NA	NA
Fuel oil	-	NA	NA	NA	NA	NA
Lubricating oil	-	NA	NA	NA	NA	NA

TABLE A.4
GROUNDWATER SAMPLES - ROUND I
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
LEICA INC.
CHEEKTOWAGA, NEW YORK

	NYS SCG	*MW-13* *01/06/94*	*MW-14* *01/06/94*	*MW-18C* *01/06/94*	*MW-15* *01/06/94*	*MW-16* *01/07/94*
Semi-Volatiles (µg/L)						
Phenol	-	ND (10)	ND (10)	ND (10)	NA	ND (10)
bis(2-Chloroethyl)ether	1.0 (S)	ND (10)	ND (10)	ND (10)	NA	ND (10)
2-Chlorophenol	-	ND (10)	ND (10)	ND (10)	NA	ND (10)
1,3-Dichlorobenzene	5 (S)	ND (10)	ND (10)	ND (10)	NA	ND (10)
1,4-Dichlorobenzene	4.7 (S)	ND (10)	ND (10)	ND (10)	NA	ND (10)
1,2-Dichlorobenzene	4.7 (S)	ND (10)	ND (10)	ND (10)	NA	ND (10)
2-Methylphenol	-	ND (10)	ND (10)	ND (10)	NA	4J
2,2'-oxybis(1-Chloropropane)	-	ND (10)	ND (10)	ND (10)	NA	ND (10)
4-Methylphenol	-	ND (10)	ND (10)	ND (10)	NA	5J
N-Nitro-di-n-propylamine	-	ND (10)	ND (10)	ND (10)	NA	ND (10)
Hexachloroethane	-	ND (10)	ND (10)	ND (10)	NA	ND (10)
Nitrobenzene	5 (S)	ND (10)	ND (10)	ND (10)	NA	ND (10)
Isophorone	50 (G)	ND (10)	ND (10)	ND (10)	NA	ND (10)
2-Nitrophenol	-	ND (10)	ND (10)	ND (10)	NA	ND (10)
2,4-Dimethylphenol	-	ND (10)	ND (10)	ND (10)	NA	26
bis(2-Chloroethoxy)methane	-	ND (10)	ND (10)	ND (10)	NA	ND (10)
2,4-Dichlorophenol	-	ND (10)	ND (10)	ND (10)	NA	ND (10)
1,2,4-Trichlorobenzene	5 (S)	ND (10)	ND (10)	ND (10)	NA	ND (10)
Naphthalene	10 (G)	ND (10)	ND (10)	ND (10)	NA	42
4-Chloroaniline	-	ND (10)	ND (10)	ND (10)	NA	ND (10)
Hexachlorobutadiene	5 (S)	ND (10)	ND (10)	ND (10)	NA	ND (10)
4-Chloro-3-methylphenol	-	ND (10)	ND (10)	ND (10)	NA	19J
2-Methylnaphthalene	-	ND (10)	ND (10)	ND (10)	NA	ND (10)
Hexachlorocyclopentadiene	5 (S)	ND (10)J	ND (10)J	ND (10)J	NA	ND (10)J
2,4,6-Trichlorophenol	-	ND (10)	ND (10)	ND (10)	NA	ND (10)
2,4,5-Trichlorophenol	-	ND (25)	ND (25)	ND (25)	NA	ND (25)
2-Chloronaphthalene	10 (G)	ND (10)	ND (10)	ND (10)	NA	ND (10)
2-Nitroaniline	-	ND (25)	ND (25)	ND (25)	NA	ND (25)
Dimethylphthalate	50 (G)	ND (10)	ND (10)	ND (10)	NA	ND (10)
Acenaphthylene	-	ND (10)	ND (10)	ND (10)	NA	ND (10)
2,6-Dinitrotoluene	5 (S)	ND (10)	ND (10)	ND (10)	NA	ND (10)
3-Nitroaniline	-	ND (25)J	ND (25)J	ND (25)J	NA	ND (25)J
Acenaphthene	20 (G)	ND (10)	ND (10)	ND (10)	NA	ND (10)
2,4-Dinitrophenol	-	ND (25)J	ND (25)J	ND (25)J	NA	ND (25)J
4-Nitrophenol	-	ND (25)J	ND (25)J	ND (25)J	NA	ND (25)J
Dibenzofuran	-	ND (10)	ND (10)	ND (10)	NA	ND (10)
2,4-Dinitrotoluene	-	ND (10)	ND (10)	ND (10)	NA	ND (10)
Diethylphthalate	50 (G)	ND (10)	ND (10)	ND (10)	NA	ND (10)

TABLE A.4
GROUNDWATER SAMPLES - ROUND I
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
LEICA INC.
CHEEKTOWAGA, NEW YORK

	NYS SCG	MW-13 01/06/94	MW-14 01/06/94	MW-18C 01/06/94	MW-15 01/06/94	MW-16 01/07/94
Semi-Volatiles (µg/L) (cont'd.)						
4-Chlorophenyl-phenylether	-	ND (10)	ND (10)	ND (10)	NA	ND (10)
Fluorene	50 (G)	ND (10)	ND (10)	ND (10)	NA	ND (10)
4-Nitroaniline	-	ND (25)J	ND (25)J	ND (25)J	NA	ND (25)J
4,6-Dinitro-2-methylphenol	-	ND (25)	ND (25)	ND (25)	NA	ND (25)
N-Nitrosodiphenylamine(1)	50 (G)	ND (10)J	ND (10)J	ND (10)J	NA	ND (10)J
4-Bromophenyl-phenylether	-	ND (10)	ND (10)	ND (10)	NA	ND (10)
Hexachlorobenzene	0.35 (S)	ND (10)	ND (10)	ND (10)	NA	ND (10)
Pentachlorophenol	-	ND (25)	ND (25)	ND (25)	NA	ND (25)
Phenanthrene	50 (G)	ND (10)	ND (10)	ND (10)	NA	ND (10)
Anthracene	50 (G)	ND (10)	ND (10)	ND (10)	NA	ND (10)
Carbazole	-	ND (10)	ND (10)	ND (10)	NA	ND (10)
Di-n-butylphthalate	50 (S)	ND (10)	ND (10)	ND (10)	NA	ND (10)
Fluoranthene	50 (G)	ND (10)	ND (10)	ND (10)	NA	ND (10)
Pyrene	50 (G)	ND (10)	ND (10)	ND (10)	NA	ND (10)
Butylbenzylphthalate	50 (G)	ND (10)	ND (10)	ND (10)	NA	ND (10)
3,3'-Dichlorobenzidine	-	ND (10)	ND (10)	ND (10)	NA	ND (10)
Benzo(a)anthracene	0.002 (G)	ND (10)	ND (10)	ND (10)	NA	ND (10)
Chrysene	0.002 (G)	ND (10)	ND (10)	ND (10)	NA	ND (10)
bis(2-Ethylhexyl)phthalate	50 (S)	ND (10)	ND (10)	ND (10)	NA	ND (10)
Di-n-octylphthalate	50 (G)	ND (10)	ND (10)	ND (10)	NA	ND (10)
Benzo(b)fluoranthene	0.002 (G)	ND (10)	ND (10)	ND (10)	NA	ND (10)
Benzo(k)fluoranthene	0.002 (G)	ND (10)	ND (10)	ND (10)	NA	ND (10)
Benzo(a)pyrene	0.002 (G)	ND (10)	ND (10)	ND (10)	NA	ND (10)
Indeno(1,2,3-cd)pyrene	0.002 (G)	ND (10)	ND (10)	ND (10)	NA	ND (10)
Dibenzo(a,h)anthracene	-	ND (10)	ND (10)	ND (10)	NA	ND (10)
Benzo(g,h,i)perylene	-	ND (10)	ND (10)	ND (10)	NA	ND (10)
Metals (µg/L)						
Aluminum	-	6,970	27,200J	39,800J	NA	9,250
Antimony	3 (G)	ND (7.9)	ND (7.9)	ND (10.7)	NA	ND (7.9)
Arsenic	25 (S)	2	9	14	NA	6
Barium	1,000 (S)	245	251	352	NA	266
Beryllium	3 (G)	ND (0.77)	ND (1.7)	ND (2.0)	NA	ND (0.77)
Cadmium	10 (S)	ND (1.8)	ND (2.2)	ND (3.3)	NA	ND (2.7)
Calcium	-	186,000	466,000	584,000	NA	168,000
Chromium	50 (S)	53	73	92	NA	83
Cobalt	-	8	16	24	NA	10
Copper	200 (S)	22	75	88	NA	53.0
Iron	300 (S) *	12,700	41,600J	60,900J	NA	21,600
Lead	25 (S)	ND (10.4)	65.6J	112J	NA	18
Magnesium	35,000 (G)	81,900	251,000	290,000	NA	55,700
Manganese	300 (S) *	254	1,390	1,850	NA	599
Mercury	2 (S)	ND (0.10)	ND (0.10)	ND (0.10)	NA	ND (0.10)
Nickel	-	70.0	128	138	NA	175
Potassium	-	3,970	10,900	13,800	NA	6,850

TABLE A.4
GROUNDWATER SAMPLES - ROUND I
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
LEICA INC.
CHEEKTOWAGA, NEW YORK

	NYS SCG	*MW-13* *01/06/94*	*MW-14* *01/06/94*	*MW-18C* *01/06/94*	*MW-15* *01/06/94*	*MW-16* *01/07/94*
Metals (µg/L) Cont'd.						
Selenium	10 (S)	ND (2.2)J	ND (2.2)J	ND (11.0)J	NA	ND (2.2)J
Silver	50 (S)	ND (2.1)	ND (2.1)	ND (2.1)	NA	ND (2.1)
Sodium	20,000 (S)	16,200	78,800	77,100	NA	361,000
Thallium	4 (G)	ND (1.2)	ND (1.2)	ND (1.2)	NA	ND (1.2)
Vanadium	-	9.0B	38.3B	62	NA	12
Zinc	300 (S)	35.7J	207J	257J	NA	132J
Wet Chemistry (mg/L)						
Total Petroleum Hydrocarbons	-	3.50.	ND (2.5)	ND (2.5)	ND (2.5)	ND (2.5)

Notes:

(G)	Guidance value
(S)	Standard value
*	Manganese and iron < 500 µg/L
-	Not Available
APL	Aqueous Phase Liquid
D	Value quantitated from a dilution
Dup	Field Duplicate
J	Associated value is estimated
NA	Not analyzed
NAPL	Non-Aqueous Phase Liquid
R	Rejected value
U	Non-detect at the associated value

TABLE A.4
GROUNDWATER SAMPLES - ROUND I
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
LEICA INC.
CHEEKTOWAGA, NEW YORK

	NYS SCG	*East Well 01/14/94*	*East Well 01/14/94*	*MW-2A 01/13/94*	*MW-5A 01/13/94*	*MW-6A 01/12/94*
Volatiles (µg/L)						
1,1,1-Trichloroethane	5 (S)	ND (10)	13	ND (10)	ND (10)	ND (10)J
1,1,2,2-Tetrachloroethane	5 (S)	ND (10)J	ND (10)J	ND (10)J	ND (10)J	ND (10)J
1,1,2-Trichloroethane	5 (S)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)J
1,1-Dichloroethane	5 (S)	ND (10)	49	ND (10)	ND (10)	6J
1,1-Dichloroethene	5 (S)	ND (10)	7J	ND (10)	ND (10)	140J
1,2-Dichloroethane	5 (S)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)J
1,2-Dichloroethene (total)	5 (S)	6J	640D	ND (10)	ND (10)	390,000D
1,2-Dichloropropane	5 (S)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)J
2-Butanone	50 (G)	ND (10)	ND (10)J	ND (10)J	ND (10)J	ND (10)J
2-Hexanone	50 (G)	ND (10)	ND (10)J	ND (10)J	ND (10)J	ND (10)J
4-Methyl-2-pentanone	-	ND (10)	ND (10)	ND (10)	ND (10)	7J
Acetone	50 (G)	ND (10)	ND (10)J	ND (10)J	3J	16J
Benzene	0.7 (S)	ND (10)	ND (10)	ND (10)	ND (10)	38J
Bromodichloromethane	50 (G)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)J
Bromoform	50 (G)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)J
Bromomethane	5 (S)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)J
Carbon disulfide	-	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)J
Carbon tetrachloride	5 (S)	ND (10)J	ND (10)	ND (10)	ND (10)	ND (10)J
Chlorobenzene	5 (S)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Chloroethane	5 (S)	ND (10)	ND (10)J	ND (10)J	ND (10)J	ND (10)J
Chloroform	7 (S)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)J
Chloromethane	-	ND (10)J	ND (10)J	ND (10)J	ND (10)J	ND (10)J
cis-1,3-Dichloropropene	5 (S)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)J
Dibromochloromethane	50 (G)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)J
Ethylbenzene	5 (S)	ND (10)	1J	ND (10)	ND (10)	140J
Methylene chloride	5 (S)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)J
Styrene	5 (S)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Tetrachloroethene	5 (S)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Toluene	5 (S)	ND (10)	2J	ND (10)	ND (10)	180J
trans-1,3-Dichloropropene	5 (S)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)J
Trichloroethene	5 (S)	3J	360D	8J	ND (10)	90J
Vinyl chloride	2 (S)	ND (10)	170D	ND (10)J	ND (10)J	110,000D
Xylene (total)	5 (S)	ND (10)	3J	ND (10)	ND (10)	7,000JD
Petroleum Products (µg/L)						
Gasoline	-	NA	NA	NA	NA	NA
Kerosene	-	NA	NA	NA	NA	NA
Fuel oil	-	NA	NA	NA	NA	NA
Lubricating oil	-	NA	NA	NA	NA	NA

TABLE A.4
GROUNDWATER SAMPLES - ROUND I
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
LEICA INC.
CHEEKTOWAGA, NEW YORK

		East Well	*East Well*	*MW-2A*	*MW-5A*	*MW-6A*
	NYS SCG	*01/14/94*	*01/14/94*	*01/13/94*	*01/13/94*	*01/12/94*
Semi-Volatiles (µg/L)						
Phenol	-	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
bis(2-Chloroethyl)ether	1.0 (S)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
2-Chlorophenol	-	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
1,3-Dichlorobenzene	5 (S)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
1,4-Dichlorobenzene	4.7 (S)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
1,2-Dichlorobenzene	4.7 (S)	ND (10)	ND (10)	ND (10)	ND (10)	4J
2-Methylphenol	-	ND (10)	ND (10)	ND (10)	ND (10)	20
2,2'-oxybis(1-Chloropropane)	-	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
4-Methylphenol	-	ND (10)	ND (10)	ND (10)	ND (10)	62
N-Nitro-di-n-propylamine	-	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Hexachloroethane	-	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Nitrobenzene	5 (S)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Isophorone	50 (G)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
2-Nitrophenol	-	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
2,4-Dimethylphenol	-	ND (10)	ND (10)	ND (10)	ND (10)	11
bis(2-Chloroethoxy)methane	-	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
2,4-Dichlorophenol	-	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
1,2,4-Trichlorobenzene	5 (S)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Naphthalene	10 (G)	ND (10)	ND (10)	ND (10)	ND (10)	3J
4-Chloroaniline	-	ND (10)J	ND (10)J	ND (10)J	ND (10)J	ND (10)J
Hexachlorobutadiene	5 (S)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
4-Chloro-3-methylphenol	-	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
2-Methylnaphthalene	-	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Hexachlorocyclopentadiene	5 (S)	ND (10)J	ND (10)J	ND (10)J	ND (10)J	ND (10)J
2,4,6-Trichlorophenol	-	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
2,4,5-Trichlorophenol	-	ND (25)	ND (25)	ND (25)	ND (25)	ND (25)
2-Chloronaphthalene	10 (G)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
2-Nitroaniline	-	ND (25)	ND (25)	ND (25)	ND (25)	ND (25)
Dimethylphthalate	50 (G)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Acenaphthylene	-	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
2,6-Dinitrotoluene	5 (S)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
3-Nitroaniline	-	ND (25)J	ND (25)J	ND (25)J	ND (25)J	ND (25)J
Acenaphthene	20 (G)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
2,4-Dinitrophenol	-	ND (25)J	ND (25)J	ND (25)J	ND (25)J	ND (25)J
4-Nitrophenol	-	ND (25)J	ND (25)J	ND (25)J	ND (25)J	ND (25)J
Dibenzofuran	-	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
2,4-Dinitrotoluene	-	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Diethylphthalate	50 (G)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)

TABLE A.4
GROUNDWATER SAMPLES - ROUND I
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
LEICA INC.
CHEEKTOWAGA, NEW YORK

	NYS SCG	*East Well* *01/14/94*	*East Well* *01/14/94*	*MW-2A* *01/13/94*	*MW-5A* *01/13/94*	*MW-6A* *01/12/94*
Semi-Volatiles (µg/L) (cont'd.)						
4-Chlorophenyl-phenylether	-	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Fluorene	50 (G)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
4-Nitroaniline	-	ND (25)J	ND (25)J	ND (25)J	ND (25)J	ND (25)J
4,6-Dinitro-2-methylphenol	-	ND (25)	ND (25)	ND (25)	ND (25)	ND (25)
N-Nitrosodiphenylamine(1)	50 (G)	ND (10)J	ND (10)J	ND (10)J	ND (10)J	ND (10)J
4-Bromophenyl-phenylether	-	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Hexachlorobenzene	0.35 (S)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Pentachlorophenol	-	ND (25)	ND (25)	ND (25)	ND (25)	ND (25)
Phenanthrene	50 (G)	ND (10)J	ND (10)J	ND (10)J	ND (10)J	ND (10)J
Anthracene	50 (G)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Carbazole	-	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Di-n-butylphthalate	50 (S)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Fluoranthene	50 (G)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Pyrene	50 (G)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Butylbenzylphthalate	50 (G)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
3,3'-Dichlorobenzidine	-	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Benzo(a)anthracene	0.002 (G)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Chrysene	0.002 (G)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
bis(2-Ethylhexyl)phthalate	50 (S)	ND (10)	ND (10)	40	3J	2J
Di-n-octylphthalate	50 (G)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Benzo(b)fluoranthene	0.002 (G)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Benzo(k)fluoranthene	0.002 (G)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Benzo(a)pyrene	0.002 (G)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Indeno(1,2,3-cd)pyrene	0.002 (G)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Dibenzo(a,h)anthracene	-	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Benzo(g,h,i)perylene	-	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Metals (µg/L)						
Aluminum	-	ND (49.7)	NA	732	8,810	231
Antimony	3 (G)	ND (7.9)	NA	ND (7.9)	ND (7.9)	ND (7.9)
Arsenic	25 (S)	4.8J	NA	3.6J	4	2.0J
Barium	1,000 (S)	95	NA	59	296	458
Beryllium	3 (G)	ND (0.50)	NA	ND (0.50)	ND (0.50)	ND (0.50)
Cadmium	10 (S)	ND (1.3)	NA	ND (1.3)	ND (1.3)	ND (1.9)
Calcium	-	80,500	NA	105,000	179,000	134,000
Chromium	50 (S)	ND (6.4)	NA	9	14	10
Cobalt	-	ND (3.2)	NA	32	4	3
Copper	200 (S)	ND (3.6)	NA	ND (8.5)	ND (12.3)	25
Iron	300 (S) *	5,620	NA	8,330	13,800	3,750
Lead	25 (S)	ND (2.6)	NA	ND (2.7)	13	ND (5.2)
Magnesium	35,000 (G)	32,300	NA	38,400	147,000	93,000
Manganese	300 (S) *	145	NA	93	414	80
Mercury	2 (S)	ND (0.10)	NA	ND (0.10)	ND (0.10)	ND (0.10)
Nickel	-	ND (4.8)	NA	7	7	18
Potassium	-	1,630	NA	3,740	10,500	6,360

TABLE A.4
GROUNDWATER SAMPLES - ROUND I
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
LEICA INC.
CHEEKTOWAGA, NEW YORK

	NYS SCG	*East Well* *01/14/94*	*East Well* *01/14/94*	*MW-2A* *01/13/94*	*MW-5A* *01/13/94*	*MW-6A* *01/12/94*
Metals (µg/L) Cont'd.						
Selenium	10 (S)	ND (2.2)J	NA	ND (2.2)J	ND (2.2)J	ND (2.2)J
Silver	50 (S)	ND (2.1)	NA	ND (2.1)	ND (2.1)	ND (2.1)
Sodium	20,000 (S)	133,000	NA	11,600	52,700	99,200
Thallium	4 (G)	ND (1.2)	NA	ND (1.2)	ND (1.2)	ND (1.2)
Vanadium	-	ND (2.0)	NA	ND (2.0)	7	ND (2.0)
Zinc	300 (S)	91.1J	NA	ND (22.3)	66.8J	596J
Wet Chemistry (mg/L)						
Total Petroleum Hydrocarbons	-	ND (2.5)	ND (2.5)	ND (2.5)	ND (2.5)	ND (2.5)

Notes:

(G)	Guidance value
(S)	Standard value
*	Manganese and iron < 500 µg/L
-	Not Available
APL	Aqueous Phase Liquid
D	Value quantitated from a dilution
Dup	Field Duplicate
J	Associated value is estimated
NA	Not analyzed
NAPL	Non-Aqueous Phase Liquid
R	Rejected value
U	Non-detect at the associated value

TABLE A.4
GROUNDWATER SAMPLES - ROUND I
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
LEICA INC.
CHEEKTOWAGA, NEW YORK

	NYS SCG	*MW-13A* *01/13/94*	*MW-14A* *01/13/94*	*MW-15A* *01/14/94*
Volatiles (µg/L)				
1,1,1-Trichloroethane	5 (S)	ND (10)	ND (10)	ND (10)
1,1,2,2-Tetrachloroethane	5 (S)	ND (10)J	ND (10)J	ND (10)J
1,1,2-Trichloroethane	5 (S)	ND (10)	ND (10)	ND (10)
1,1-Dichloroethane	5 (S)	ND (10)	ND (10)	19
1,1-Dichloroethene	5 (S)	ND (10)	ND (10)	5J
1,2-Dichloroethane	5 (S)	ND (10)	ND (10)	ND (10)
1,2-Dichloroethene (total)	5 (S)	25	46	650D
1,2-Dichloropropane	5 (S)	ND (10)	ND (10)	ND (10)
2-Butanone	50 (G)	ND (10)	ND (10)J	ND (10)J
2-Hexanone	50 (G)	ND (10)	ND (10)J	ND (10)J
4-Methyl-2-pentanone	-	ND (10)	ND (10)	ND (10)
Acetone	50 (G)	ND (10)	ND (10)J	4J
Benzene	0.7 (S)	ND (10)	ND (10)	1J
Bromodichloromethane	50 (G)	ND (10)	ND (10)	ND (10)
Bromoform	50 (G)	ND (10)	ND (10)	ND (10)
Bromomethane	5 (S)	ND (10)	ND (10)	ND (10)
Carbon disulfide	-	ND (10)	ND (10)	ND (10)
Carbon tetrachloride	5 (S)	ND (10)J	ND (10)	ND (10)
Chlorobenzene	5 (S)	ND (10)	ND (10)	ND (10)
Chloroethane	5 (S)	ND (10)	ND (10)J	ND (10)J
Chloroform	7 (S)	ND (10)	ND (10)	ND (10)
Chloromethane	-	ND (10)J	ND (10)J	ND (10)J
cis-1,3-Dichloropropene	5 (S)	ND (10)	ND (10)	ND (10)
Dibromochloromethane	50 (G)	ND (10)	ND (10)	ND (10)
Ethylbenzene	5 (S)	ND (10)	ND (10)	ND (10)
Methylene chloride	5 (S)	ND (10)	ND (10)	ND (10)
Styrene	5 (S)	ND (10)	ND (10)	ND (10)
Tetrachloroethene	5 (S)	ND (10)	ND (10)	ND (10)
Toluene	5 (S)	ND (10)	3J	3J
trans-1,3-Dichloropropene	5 (S)	ND (10)	ND (10)	ND (10)
Trichloroethene	5 (S)	3J	ND (10)	8J
Vinyl chloride	2 (S)	ND (10)	28J	300D
Xylene (total)	5 (S)	3J	3J	4J
Petroleum Products (µg/L)				
Gasoline	-	NA	NA	NA
Kerosene	-	NA	NA	NA
Fuel oil	-	NA	NA	NA
Lubricating oil	-	NA	NA	NA

TABLE A.4
GROUNDWATER SAMPLES - ROUND I
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
LEICA INC.
CHEEKTOWAGA, NEW YORK

	NYS SCG	*MW-13A* *01/13/94*	*MW-14A* *01/13/94*	*MW-15A* *01/14/94*
Semi-Volatiles (µg/L)				
Phenol	-	ND (10)	ND (10)	ND (10)
bis(2-Chloroethyl)ether	1.0 (S)	ND (10)	ND (10)	ND (10)
2-Chlorophenol	-	ND (10)	ND (10)	ND (10)
1,3-Dichlorobenzene	5 (S)	ND (10)	ND (10)	ND (10)
1,4-Dichlorobenzene	4.7 (S)	ND (10)	ND (10)	ND (10)
1,2-Dichlorobenzene	4.7 (S)	ND (10)	ND (10)	ND (10)
2-Methylphenol	-	ND (10)	ND (10)	ND (10)
2,2'-oxybis(1-Chloropropane)	-	ND (10)	ND (10)	ND (10)
4-Methylphenol	-	ND (10)	ND (10)	ND (10)
N-Nitro-di-n-propylamine	-	ND (10)	ND (10)	ND (10)
Hexachloroethane	-	ND (10)	ND (10)	ND (10)
Nitrobenzene	5 (S)	ND (10)	ND (10)	ND (10)
Isophorone	50 (G)	ND (10)	ND (10)	ND (10)
2-Nitrophenol	-	ND (10)	ND (10)	ND (10)
2,4-Dimethylphenol	-	ND (10)	ND (10)	ND (10)
bis(2-Chloroethoxy)methane	-	ND (10)	ND (10)	ND (10)
2,4-Dichlorophenol	-	ND (10)	ND (10)	ND (10)
1,2,4-Trichlorobenzene	5 (S)	ND (10)	ND (10)	ND (10)
Naphthalene	10 (G)	ND (10)	ND (10)	ND (10)
4-Chloroaniline	-	ND (10)J	ND (10)J	ND (10)J
Hexachlorobutadiene	5 (S)	ND (10)	ND (10)	ND (10)
4-Chloro-3-methylphenol	-	ND (10)	ND (10)	ND (10)
2-Methylnaphthalene	-	ND (10)	ND (10)	ND (10)
Hexachlorocyclopentadiene	5 (S)	ND (10)J	ND (10)J	ND (10)J
2,4,6-Trichlorophenol	-	ND (10)	ND (10)	ND (10)
2,4,5-Trichlorophenol	-	ND (25)	ND (25)	ND (25)
2-Chloronaphthalene	10 (G)	ND (10)	ND (10)	ND (10)
2-Nitroaniline	-	ND (25)	ND (25)	ND (25)
Dimethylphthalate	50 (G)	ND (10)	ND (10)	ND (10)
Acenaphthylene	-	ND (10)	ND (10)	ND (10)
2,6-Dinitrotoluene	5 (S)	ND (10)	ND (10)	ND (10)
3-Nitroaniline	-	ND (25)J	ND (25)J	ND (25)J
Acenaphthene	20 (G)	ND (10)	ND (10)	ND (10)
2,4-Dinitrophenol	-	ND (25)J	ND (25)J	ND (25)J
4-Nitrophenol	-	ND (25)J	ND (25)J	ND (25)J
Dibenzofuran	-	ND (10)	ND (10)	ND (10)
2,4-Dinitrotoluene	-	ND (10)	ND (10)	ND (10)
Diethylphthalate	50 (G)	ND (10)	ND (10)	ND (10)

TABLE A.4
GROUNDWATER SAMPLES - ROUND I
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
LEICA INC.
CHEEKTOWAGA, NEW YORK

	NYS SCG	*MW-13A* *01/13/94*	*MW-14A* *01/13/94*	*MW-15A* *01/14/94*
Semi-Volatiles (µg/L) (cont'd.)				
4-Chlorophenyl-phenylether	-	ND (10)	ND (10)	ND (10)
Fluorene	50 (G)	ND (10)	ND (10)	ND (10)
4-Nitroaniline	-	ND (25)J	ND (25)J	ND (25)J
4,6-Dinitro-2-methylphenol	-	ND (25)	ND (25)	ND (25)
N-Nitrosodiphenylamine(1)	50 (G)	ND (10)J	ND (10)J	ND (10)J
4-Bromophenyl-phenylether	-	ND (10)	ND (10)	ND (10)
Hexachlorobenzene	0.35 (S)	ND (10)	ND (10)	ND (10)
Pentachlorophenol	-	ND (25)	ND (25)	ND (25)
Phenanthrene	50 (G)	ND (10)J	ND (10)J	ND (10)J
Anthracene	50 (G)	ND (10)	ND (10)	ND (10)
Carbazole	-	ND (10)	ND (10)	ND (10)
Di-n-butylphthalate	50 (S)	ND (10)	ND (10)	ND (10)
Fluoranthene	50 (G)	ND (10)	ND (10)	ND (10)
Pyrene	50 (G)	ND (10)	ND (10)	ND (10)
Butylbenzylphthalate	50 (G)	ND (10)	ND (10)	ND (10)
3,3'-Dichlorobenzidine	-	ND (10)	ND (10)	ND (10)
Benzo(a)anthracene	0.002 (G)	ND (10)	ND (10)	ND (10)
Chrysene	0.002 (G)	ND (10)	ND (10)	ND (10)
bis(2-Ethylhexyl)phthalate	50 (S)	1J	2J	ND (10)
Di-n-octylphthalate	50 (G)	ND (10)	ND (10)	ND (10)
Benzo(b)fluoranthene	0.002 (G)	ND (10)	ND (10)	ND (10)
Benzo(k)fluoranthene	0.002 (G)	ND (10)	ND (10)	ND (10)
Benzo(a)pyrene	0.002 (G)	ND (10)	ND (10)	ND (10)
Indeno(1,2,3-cd)pyrene	0.002 (G)	ND (10)	ND (10)	ND (10)
Dibenzo(a,h)anthracene	-	ND (10)	ND (10)	ND (10)
Benzo(g,h,i)perylene	-	ND (10)	ND (10)	ND (10)
Metals (µg/L)				
Aluminum	-	480	636	450
Antimony	3 (G)	ND (7.9)	ND (7.9)	ND (7.9)
Arsenic	25 (S)	2.0	3	5
Barium	1,000 (S)	230	214	139
Beryllium	3 (G)	ND (0.50)	ND (0.50)	ND (0.50)
Cadmium	10 (S)	ND (1.3)	ND (1.3)	ND (1.3)
Calcium	-	436,000	165,000	135,000
Chromium	50 (S)	ND (6.4)	11	ND (6.4)
Cobalt	-	ND (3.2)	ND (3.2)	ND (3.2)
Copper	200 (S)	ND (9.3)	14	17
Iron	300 (S) *	4,670	5,210	2,610
Lead	25 (S)	ND (2.9)	ND (3.0)	ND (2.1)
Magnesium	35,000 (G)	68,100	75,900	60,800
Manganese	300 (S) *	173	102	66.0
Mercury	2 (S)	ND (0.10)	ND (0.10)	ND (0.10)
Nickel	-	6	6.0	ND (4.8)
Potassium	-	2,150	3,450	3,130

TABLE A.4
GROUNDWATER SAMPLES - ROUND I
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
LEICA INC.
CHEEKTOWAGA, NEW YORK

	NYS SCG	*MW-13A* *01/13/94*	*MW-14A* *01/13/94*	*MW-15A* *01/14/94*
Metals (µg/L) Cont'd.				
Selenium	10 (S)	ND (2.2)J	ND (2.2)J	ND (2.2)J
Silver	50 (S)	ND (2.1)	ND (2.1)	ND (2.1)
Sodium	20,000 (S)	10,400	20,400	154,000
Thallium	4 (G)	ND (1.2)	ND (1.2)	ND (1.2)
Vanadium	-	ND (2.0)	ND (2.0)	ND (2.0)
Zinc	300 (S)	ND (15.7)	24.6J	ND (20.4)
Wet Chemistry (mg/L)				
Total Petroleum Hydrocarbons	-	ND (2.5)	ND (2.5)	ND (2.5)

Notes:

(G)	Guidance value
(S)	Standard value
*	Manganese and iron < 500 µg/L
-	Not Available
APL	Aqueous Phase Liquid
D	Value quantitated from a dilution
Dup	Field Duplicate
J	Associated value is estimated
NA	Not analyzed
NAPL	Non-Aqueous Phase Liquid
R	Rejected value
U	Non-detect at the associated value

TABLE A.5
GROUNDWATER SAMPLES - ROUND II
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
LEICA INC.
CHEEKTOWAGA, NEW YORK

		MW-1	*MW-2*	*MW-18C (Dup of MW-2)*	*MW-3*	*MW-5*	*MW-13*
	NYS SCG	*03/24/94*	*03/22/94*	*03/22/94*	*03/22/94*	*03/22/94*	*03/23/94*
TCL Volatiles (µg/L)							
1,1,1-Trichloroethane	5 (S)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
1,1,2,2-Tetrachloroethane	5 (S)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
1,1,2-Trichloroethane	5 (S)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
1,1-Dichloroethane	5 (S)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
1,1-Dichloroethene	5 (S)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
1,2-Dichloroethane	5 (S)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
1,2-Dichloroethene (total)	5 (S)	ND (10)	4J	4J	ND (10)	ND (10)	ND (10)
1,2-Dichloropropane	5 (S)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
2-Butanone	50 (G)	ND (10)J	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)J
2-Hexanone	50 (G)	ND (10)J	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)J
4-Methyl-2-pentanone	-	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Acetone	50 (G)	ND (10)J	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)J
Benzene	0.7 (S)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Bromodichloromethane	50 (G)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Bromoform	50 (G)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Bromomethane	5 (S)	ND (10)J	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)J
Carbon disulfide	-	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Carbon tetrachloride	5 (S)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Chlorobenzene	5 (S)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Chloroethane	5 (S)	ND (10)J	ND (10)J	ND (10)J	ND (10)J	ND (10)J	ND (10)J
Chloroform	7 (S)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Chloromethane	-	ND (10)J	ND (10)J	ND (10)J	ND (10)J	ND (10)J	ND (10)J
cis-1,3-Dichloropropene	5 (S)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Dibromochloromethane	50 (G)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Ethylbenzene	5 (S)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Methylene chloride	5 (S)	ND (10)	ND (10)J	ND (10)J	ND (10)J	ND (10)J	ND (10)
Styrene	5 (S)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Tetrachloroethene	5 (S)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Toluene	5 (S)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
trans-1,3-Dichloropropene	5 (S)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Trichloroethene	5 (S)	ND (10)	40	41	ND (10)	ND (10)	ND (10)
Vinyl chloride	2 (S)	ND (10)J	ND (10)J	ND (10)J	ND (10)J	ND (10)J	ND (10)J
Xylene (total)	5 (S)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)

Notes:

(G)	Guidance value
(S)	Standard value
-	Not available
D	Value quantitated from a dilution.
Dup.	Field Duplicate
J	Associated value is estimated.
TCL	Target Compound List
U	Non-detect at the associated value.

TABLE A.5
GROUNDWATER SAMPLES - ROUND II
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
LEICA INC.
CHEEKTOWAGA, NEW YORK

		MW-14	*MW-15*	*MW-16*	*MW-19C*	*MW-2A*	*MW-5A*
					(Dup of MW-16)		
	NYS SCG	*03/23/94*	*03/24/94*	*03/24/94*	*03/24/94*	*03/22/94*	*03/24/94*
TCL Volatiles (µg/L)							
1,1,1-Trichloroethane	5 (S)	ND (10)	ND (10)	77J	79J	ND (10)	ND (10)
1,1,2,2-Tetrachloroethane	5 (S)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
1,1,2-Trichloroethane	5 (S)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
1,1-Dichloroethane	5 (S)	ND (10)	ND (10)	3,000D	3,300D	ND (10)	ND (10)
1,1-Dichloroethene	5 (S)	2J	ND (10)	240JD	280JD	ND (10)	ND (10)
1,2-Dichloroethane	5 (S)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
1,2-Dichloroethene (total)	5 (S)	690D	ND (10)	3,900D	4,200D	4J	3J
1,2-Dichloropropane	5 (S)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
2-Butanone	50 (G)	7JD	ND (10)J	ND (10)J	ND (10)J	ND (10)	ND (10)J
2-Hexanone	50 (G)	ND (10)J	ND (10)J	ND (10)J	ND (10)J	ND (10)	ND (10)J
4-Methyl-2-pentanone	-	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Acetone	50 (G)	3J	4J	ND (10)J	ND (10)J	ND (10)	ND (10)J
Benzene	0.7 (S)	1J	ND (10)	1J	2J	ND (10)	ND (10)
Bromodichloromethane	50 (G)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Bromoform	50 (G)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Bromomethane	5 (S)	16JD	ND (10)J	ND (10)J	ND (10)J	ND (10)	ND (10)J
Carbon disulfide	-	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Carbon tetrachloride	5 (S)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Chlorobenzene	5 (S)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Chloroethane	5 (S)	ND (10)J	ND (10)J	5J	ND (10)J	ND (10)J	ND (10)J
Chloroform	7 (S)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Chloromethane	-	25JD	ND (10)J	ND (10)J	ND (10)J	ND (10)J	ND (10)J
cis-1,3-Dichloropropene	5 (S)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Dibromochloromethane	50 (G)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Ethylbenzene	5 (S)	ND (10)	ND (10)	620D	670D	ND (10)	ND (10)
Methylene chloride	5 (S)	ND (10)	ND (10)	9J	9J	ND (10)J	ND (10)
Styrene	5 (S)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Tetrachloroethene	5 (S)	ND (10)	ND (10)	3J	3J	ND (10)	ND (10)
Toluene	5 (S)	ND (10)	ND (10)	160JD	180JD	ND (10)	ND (10)
trans-1,3-Dichloropropene	5 (S)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Trichloroethene	5 (S)	ND (10)	ND (10)	2,100D	2,400D	42	ND (10)
Vinyl chloride	2 (S)	11J	ND (10)J	ND (500)D	ND (500)D	ND (10)J	ND (10)J
Xylene (total)	5 (S)	ND (10)	ND (10)	1,300D	1,500D	ND (10)	ND (10)

Notes:

(G)	Guidance value
(S)	Standard value
-	Not available
D	Value quantitated from a dilution.
Dup.	Field Duplicate
J	Associated value is estimated.
TCL	Target Compound List
U	Non-detect at the associated value.

TABLE A.5
GROUNDWATER SAMPLES - ROUND II
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
LEICA INC.
CHEEKTOWAGA, NEW YORK

		MW-6A	*MW-13A*	*MW-14A*	*MW-15A*
	NYS SCG	*03/24/94*	*03/23/94*	*03/23/94*	*03/24/94*
TCL Volatiles (µg/L)					
1,1,1-Trichloroethane	5 (S)	18J	ND (10)	ND (10)	8J
1,1,2,2-Tetrachloroethane	5 (S)	ND (10)	ND (10)	ND (10)	ND (10)
1,1,2-Trichloroethane	5 (S)	ND (10)	ND (10)	ND (10)	ND (10)
1,1-Dichloroethane	5 (S)	14J	ND (10)	ND (10)	25
1,1-Dichloroethene	5 (S)	140J	ND (10)	ND (10)	4J
1,2-Dichloroethane	5 (S)	ND (10)	ND (10)	ND (10)	ND (10)
1,2-Dichloroethene (total)	5 (S)	69,000D	19	64	490D
1,2-Dichloropropane	5 (S)	ND (10)	ND (10)	ND (10)	ND (10)
2-Butanone	50 (G)	ND (10)J	ND (10)J	ND (10)J	ND (10)J
2-Hexanone	50 (G)	ND (10)J	ND (10)J	ND (10)J	ND (10)J
4-Methyl-2-pentanone	-	12J	ND (10)	ND (10)	ND (10)
Acetone	50 (G)	15J	ND (10)J	ND (10)J	ND (10)J
Benzene	0.7 (S)	67J	ND (10)	ND (10)	ND (10)
Bromodichloromethane	50 (G)	ND (10)	ND (10)	ND (10)	ND (10)
Bromoform	50 (G)	ND (10)	ND (10)	ND (10)	ND (10)
Bromomethane	5 (S)	ND (10)J	ND (10)J	ND (10)J	5JD
Carbon disulfide	-	3J	ND (10)	ND (10)	ND (10)
Carbon tetrachloride	5 (S)	ND (10)	ND (10)	ND (10)	ND (10)
Chlorobenzene	5 (S)	ND (10)	ND (10)	ND (10)	ND (10)
Chloroethane	5 (S)	ND (10)J	ND (10)J	ND (10)J	ND (10)J
Chloroform	7 (S)	ND (10)	ND (10)	ND (10)	ND (10)
Chloromethane	-	ND (10)J	ND (10)J	ND (10)J	8JD
cis-1,3-Dichloropropene	5 (S)	ND (10)	ND (10)	ND (10)	ND (10)
Dibromochloromethane	50 (G)	ND (10)	ND (10)	ND (10)	ND (10)
Ethylbenzene	5 (S)	ND (5,000)D	ND (10)	ND (10)	2J
Methylene chloride	5 (S)	2J	ND (10)	ND (10)	1J
Styrene	5 (S)	ND (10)	ND (10)	ND (10)	ND (10)
Tetrachloroethene	5 (S)	ND (10)	ND (10)	ND (10)	ND (10)
Toluene	5 (S)	ND (5,000)D	ND (10)	ND (10)	1J
trans-1,3-Dichloropropene	5 (S)	ND (10)	ND (10)	ND (10)	ND (10)
Trichloroethene	5 (S)	160J	ND (10)	ND (10)	14
Vinyl chloride	2 (S)	19,000D	1J	25J	200D
Xylene (total)	5 (S)	ND (5,000)D	2J	ND (10)	2J

Notes:

(G)	Guidance value
(S)	Standard value
-	Not available
D	Value quantitated from a dilution.
Dup.	Field Duplicate
J	Associated value is estimated.
TCL	Target Compound List
U	Non-detect at the associated value.

TABLE A.6
SUPPLEMENTAL GROUNDWATER SAMPLES
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
LEICA INC.
CHEEKTOWAGA, NEW YORK

		MW-1A	*MW-16A*	*MW-17A*	*MW-26C*	*MW-18*	*MW-19*
					(Dup. of MW-17A)		
	NYS SCG	*04/15/94*	*04/18/94*	*04/15/94*	*04/15/94*	*04/15/94*	*04/14/94*
<u>TCL Volatiles (μg/L)</u>							
1,1,1-Trichloroethane	5 (S)	ND (10)	110,000D	ND (10)	ND (10)	ND (10)	ND (10)
1,1,2,2-Tetrachloroethane	5 (S)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
1,1,2-Trichloroethane	5 (S)	ND (10)	13	ND (10)	ND (10)	ND (10)	ND (10)
1,1-Dichloroethane	5 (S)	ND (10)	4,400JD	ND (10)	ND (10)	ND (10)	ND (10)
1,1-Dichloroethene	5 (S)	ND (10)	1,200JD	ND (10)	ND (10)	ND (10)	ND (10)
1,2-Dichloroethane	5 (S)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
1,2-Dichloroethene (total)	5 (S)	14	34,000D	31	33	ND (10)	52
1,2-Dichloropropane	5 (S)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
2-Butanone	50 (G)	ND (10)	43	ND (10)	ND (10)	ND (10)	ND (10)
2-Hexanone	50 (G)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
4-Methyl-2-pentanone	-	ND (10)	91	ND (10)	ND (10)	ND (10)	ND (10)
Acetone	50 (G)	ND (10)	ND (10000)D	ND (10)	ND (10)	ND (10)	ND (10)J
Benzene	0.7 (S)	ND (10)	18	ND (10)	ND (10)	ND (10)	1.0J
Bromodichloromethane	50 (G)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Bromoform	50 (G)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Bromomethane	5 (S)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Carbon disulfide	-	ND (10)	7.0J	9.0J	9.0J	ND (10)	ND (10)J
Carbon tetrachloride	5 (S)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Chlorobenzene	5 (S)	ND (10)	2.0J	ND (10)	ND (10)	ND (10)	ND (10)
Chloroethane	5 (S)	ND (10)	160	ND (10)	ND (10)	ND (10)	ND (10)
Chloroform	7 (S)	ND (10)	8.0J	ND (10)	ND (10)	1.0J	ND (10)
Chloromethane	-	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
cis-1,3-Dichloropropene	5 (S)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Dibromochloromethane	50 (G)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Ethylbenzene	5 (S)	ND (10)	3,000JD	ND (10)	ND (10)	ND (10)	ND (10)
Methylene chloride	5 (S)	ND (10)	18	ND (10)	1.0J	ND (10)	ND (10)J
Styrene	5 (S)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Tetrachloroethene	5 (S)	ND (10)	33	ND (10)	ND (10)	ND (10)	ND (10)
Toluene	5 (S)	ND (10)	2,700JD	ND (10)	ND (10)	ND (10)	ND (10)
trans-1,3-Dichloropropene	5 (S)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Trichloroethene	5 (S)	1.0J	88,000D	32	35	ND (10)	ND (10)
Vinyl chloride	2 (S)	ND (10)	4,700JD	ND (10)	ND (10)	ND (10)	17
Xylene (total)	5 (S)	ND (10)	15,000D	ND (10)	ND (10)	ND (10)	ND (10)

Notes:

(G)	Guidance value
(S)	Standard value
-	Not Available
D	Value quantitated from a dilution.
Dup.	Field Duplicate
J	Associated value is estimated.
TCL	Target Compound List

TABLE A.6
SUPPLEMENTAL GROUNDWATER SAMPLES
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
LEICA INC.
CHEEKTOWAGA, NEW YORK

	NYS SCG	*MW-20* *04/14/94*	*MW-25C* *(Dup of MW-20)* *04/14/94*	*MW-21* *04/14/94*	*MW-22* *04/14/94*	*MW-23* *04/14/94*
TCL Volatiles (µg/L)						
1,1,1-Trichloroethane	5 (S)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
1,1,2,2-Tetrachloroethane	5 (S)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
1,1,2-Trichloroethane	5 (S)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
1,1-Dichloroethane	5 (S)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
1,1-Dichloroethene	5 (S)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
1,2-Dichloroethane	5 (S)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
1,2-Dichloroethene (total)	5 (S)	ND (10)	ND (10)	ND (10)	15	ND (10)
1,2-Dichloropropane	5 (S)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
2-Butanone	50 (G)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
2-Hexanone	50 (G)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
4-Methyl-2-pentanone	-	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Acetone	50 (G)	ND (10)J	ND (10)	ND (10)J	ND (10)	ND (10)
Benzene	0.7 (S)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Bromodichloromethane	50 (G)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Bromoform	50 (G)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Bromomethane	5 (S)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Carbon disulfide	-	ND (10)J	ND (10)	ND (10)J	ND (10)	ND (10)
Carbon tetrachloride	5 (S)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Chlorobenzene	5 (S)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Chloroethane	5 (S)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Chloroform	7 (S)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Chloromethane	-	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
cis-1,3-Dichloropropene	5 (S)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Dibromochloromethane	50 (G)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Ethylbenzene	5 (S)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Methylene chloride	5 (S)	ND (10)J	ND (10)	ND (10)J	1.0J	ND (10)
Styrene	5 (S)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Tetrachloroethene	5 (S)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Toluene	5 (S)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
trans-1,3-Dichloropropene	5 (S)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Trichloroethene	5 (S)	ND (10)	ND (10)	ND (10)	16	ND (10)
Vinyl chloride	2 (S)	ND (10)	ND (10)	5.0J	ND (10)	ND (10)
Xylene (total)	5 (S)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)

Notes:

(G)	Guidance value
(S)	Standard value
-	Not Available
D	Value quantitated from a dilution.
Dup.	Field Duplicate
J	Associated value is estimated.
TCL	Target Compound List

TABLE A.7

SUBSURFACE SOIL SAMPLES - DRUM STORAGE AREA
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
LEICA INC.
CHEEKTOWAGA, NEW YORK

	NYS Cleanup Objective	*TB-1 0-6 Ft.*	*TB-1 6-12 Ft.*
Volatile Organics (ppb)			
Acetone	200	7J	10J
Benzene	60	ND (6)	ND (5)
Bromodichloromethane	-	ND (6)	ND (5)
Bromoform	-	ND (6)	ND (5)
Bromomethane	-	ND (11)	ND (11)
2-Butanone	300	ND (11)	ND (11)
Carbon Disulfide	2,700	ND (6)	ND (5)
Carbon Tetrachloride	600	ND (6)	ND (5)
Chlorobenzene	1,700	ND (6)	ND (5)
Chloroethane	1,900	ND (11)	ND (11)
Chloroform	300	ND (6)	ND (5)
Chloromethane	-	ND (11)	ND (11)
Dibromochloromethane	-	ND (6)	ND (5)
1,1-Dichloroethane	200	6	9
1,2-Dichloroethane	100	ND (6)	ND (5)
1,1-Dichloroethene	400	1J	ND (5)
1,2-Dichloroethene (Total)	300	ND (6)	ND (5)
1,2-Dichloropropane	-	ND (6)	ND (5)
cis-1,3-Dichloropropene	-	ND (6)	ND (5)
trans-1,3-Dichloropropene	-	ND (6)	ND (5)
Ethylbenzene	-	ND (6)	ND (5)
2-Hexanone	-	ND (11)	ND (11)
Methylene Chloride	100	1J	2J
4-Methyl-2-Pentanone	1,000	ND (11)	ND (11)
Styrene	-	ND (6)	ND (5)
1,1,2,2-Tetrachloroethane	600	ND (6)	ND (5)
Tetrachloroethene	1,400	ND (6)	ND (5)
Toluene	1,500	9	2J
1,1,1-Trichloroethane	800	38	8
1,1,2-Trichloroethane	-	ND (6)	ND (5)
Trichloroethene	700	3J	2J
Vinyl Acetate	-	ND (11)	ND (11)
Vinyl Chloride	200	ND (11)	ND (11)
Xylenes (Total)	1,200	ND (6)	2J

TABLE A.7

SUBSURFACE SOIL SAMPLES - DRUM STORAGE AREA
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
LEICA INC.
CHEEKTOWAGA, NEW YORK

	NYS Cleanup Objective	*TB-1 0-6 Ft.*	*TB-1 6-12 Ft.*
Polychlorinated Biphenyls (ppb)			
Aroclor 1016	*	ND (50)	ND (46)
Aroclor 1221	*	ND (50)	ND (46)
Aroclor 1232	*	ND (50)	ND (46)
Aroclor 1242	*	ND (50)	ND (46)
Aroclor 1248	*	ND (50)	ND (46)
Aroclor 1254	*	ND (100)	ND (92)
Aroclor 1260	*	ND (100)	ND (92)
Inorganics (ppm)			
Cadmium	1	ND (0.59)	0.89
Chromium	10	9.1	8.5
Nickel	13	12	7.8
Zinc	20	24	61
Hexavalent Chromium	-	ND (0.078)	ND (0.073)
Cyanide (total)	SB	ND (0.47)	0.83
TRPH	-	323	86

Notes:

*	Total PCBs < 10,000 ppb (subsurface)
-	Not Available
J	Estimated value - Result is less than detection limit
ND (X)	Not detected at method detection limit shown
SB	Site Background
TRPH	Total Recoverable Petroleum Hydrocarbons
VOCs	Volatile Organic Compounds

TABLE A.8

SOIL SAMPLE RESULTS - FUEL OIL STORAGE AREA
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
LEICA INC.
CHEEKTOWAGA, NEW YORK

Compounds (mg/kg)	*NYS Cleanup Objective*	*TB-2 1 to 7 Ft.*	*TB-2 7 to 9 Ft.*	*TB-3 1 to 7 Ft.*	*TB-3 7 to 11 Ft.*	*TB-4 1 to 7 Ft.*	*TB-4 7 to 11 Ft.*	*TB-5 1 to 7 Ft.*	*TB-5 7 to 11 Ft.*	*TB-6 0 to 6 Ft.*	*TB-6 8 to 10 Ft.*
Benzene	0.060	0.08	0.14	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)
Toluene	1.5	ND (0.01)	1.50	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	0.15	0.022
Xylenes (Total)	1.2	0.1	0.4	ND (0.03)	ND (0.03)	ND (0.03)	ND (0.03)	ND (0.03)	ND (0.03)	ND (0.03)	ND (0.03)
Ethylbenzene	-	ND (0.01)	0.21	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)
TPH (ppm)	-	122	93	7,370	130	1,150	374	178	177	110	42

Notes:

-	Not Available
ND	Not detected at method detection limit shown
TPH	Total Petroleum Hydrocarbons

TABLE A.9

SHALLOW SOIL SAMPLE RESULTS - TCL/TAL
JANUARY 1992 SAMPLING EVENT
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
LEICA INC.
CHEEKTOWAGA, NEW YORK

	NYS Cleanup Objective	*BH-G 4.0-6.0 Ft.*	*BH-Q 4.5-6.0 Ft.*
VOCs (ug/kg)			
Benzene	60	ND (31,000)	ND (1,600)
Bromodichloromethane	NA	ND (31,000)	ND (1,600)
Bromoform	NA	ND (31,000)	ND (1,600)
Bromomethane	NA	ND (31,000)	ND (1,600)
2-Butanone	300	ND (31,000)	ND (1,600)
Carbon Disulfide	2,700	ND (31,000)	ND (1,600)
Carbon Tetrachloride	600	ND (31,000)	ND (1,600)
Chlorobenzene	1,700	ND (31,000)	ND (1,600)
Chloroethane	1,900	ND (31,000)	ND (1,600)
Chloroform	300	ND (31,000)	ND (1,600)
Chloromethane	NA	ND (31,000)	ND (1,600)
Dibromochloromethane	NA	ND (31,000)	ND (1,600)
1,1-Dichloroethane	200	ND (31,000)	ND (1,600)
1,2-Dichloroethane	100	ND (31,000)	ND (1,600)
1,1-Dichloroethene	400	ND (31,000)	ND (1,600)
1,2-Dichloroethene (Total)	300	9,100J	1,400J
1,2-Dichloropropane	NA	ND (31,000)	ND (1,600)
cis-1,3-Dichloropropene	NA	ND (31,000)	ND (1,600)
trans-1,3-Dichloropropene	NA	ND (31,000)	ND (1,600)
Ethylbenzene	NA	ND (31,000)	1,200J
2-Hexanone	NA	ND (31,000)	ND (1,600)
Methylene Chloride	100	ND (31,000)	ND (1,600)
4-Methyl-2-Pentanone	1,000	ND (31,000)	ND (1,600)
Styrene	NA	ND (31,000)	ND (1,600)
1,1,2,2-Tetrachloroethane	600	ND (31,000)	ND (1,600)
Tetrachloroethene	1,400	ND (31,000)	ND (1,600)
Toluene	1,500	ND (31,000)	500J
1,1,1-Trichloroethane	800	ND (31,000)	ND (1,600)
1,1,2-Trichloroethane	NA	ND (31,000)	ND (1,600)
Trichloroethene	700	320,000	ND (1,600)
Vinyl Acetate	NA	ND (31,000)	ND (1,600)
Vinyl Chloride	200	ND (6,200)	ND (1,600)
Xylenes (Total)	1,200	29,000J	24,000

TABLE A.9

SHALLOW SOIL SAMPLE RESULTS - TCL/TAL
JANUARY 1992 SAMPLING EVENT
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
LEICA INC.
CHEEKTOWAGA, NEW YORK

	NYS Cleanup Objective	*BH-G 4.0-6.0 Ft.*	*BH-Q 4.5-6.0 Ft.*
SVOCs (ug/kg)			
Acenaphthene	50,000	ND (330)	ND (330)
Acenaphthylene	41,000	ND (330)	ND (330)
Anthracene	50,000	ND (330)	ND (330)
Benzo (a) anthracene	224	200J	ND (330)
Benzo (b) fluoranthene	1,100	140J	ND (330)
Benzo (k) fluoranthene	1,100	37J	ND (330)
Benzo (g,h,i) perylene	50,000	130J	ND (330)
Benzo (a) pyrene	61	ND (330)	ND (330)
Benzyl alcohol	NA	ND (330)	ND (330)
Bis (2-chloroethoxy) methane	NA	ND (330)	ND (330)
Bis (2-chloroethyl) ether	NA	ND (330)	ND (330)
Bis (2-chloroisopropyl) ether	NA	ND (330)	ND (330)
Bis (2-ethylhexyl) phthalate	50,000	ND (330)	ND (330)
4-Bromophenyl phenyl ether	NA	ND (330)	ND (330)
Butyl benzyl phthalate	50,000	ND (330)	ND (330)
4-Chloroaniline	220	ND (330)	ND (330)
2-Chloronaphthalene	NA	ND (330)	ND (330)
4-Chlorophenyl phenyl ether	NA	ND (330)	ND (330)
Chrysene	400	130J	ND (330)
Dibenzo (a,h) anthracene	14	ND (330)	ND (330)
Dibenzofuran	6,200	ND (330)	ND (330)
Di-n-butyl phthalate	8,100	1,700	ND (330)
1,2-Dichlorobenzene	7,900	ND (330)	ND (330)
1,3-Dichlorobenzene	1,600	ND (330)	ND (330)
1,4-Dichlorobenzene	8,500	ND (330)	ND (330)
3,3'-Dichlorobenzidine	NA	ND (660)	ND (660)
Diethyl phthalate	7,100	ND (330)	ND (330)
Dimethyl phthalate	2,000	ND (330)	ND (330)
2,4-Dinitrotoluene	NA	ND (330)	ND (330)
2,6-Dinitrotoluene	1,000	ND (330)	ND (330)
Di-n-octyl phthalate	50,000	ND (330)	ND (330)
Fluoranthene	50,000	410	ND (330)
Fluorene	50,000	ND (330)	ND (330)
Hexachlorobenzene	410	ND (330)	ND (330)

TABLE A.9

SHALLOW SOIL SAMPLE RESULTS - TCL/TAL
JANUARY 1992 SAMPLING EVENT
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
LEICA INC.
CHEEKTOWAGA, NEW YORK

	NYS Cleanup Objective	*BH-G 4.0-6.0 Ft.*	*BH-Q 4.5-6.0 Ft.*
SVOCs Cont'd.			
Hexachlorobutadiene	NA	ND (330)	ND (330)
Hexachlorocyclopentadiene	NA	ND (330)	ND (330)
Hexachloroethane	NA	ND (330)	ND (330)
Indeno (1,2,3-cd) pyrene	3,200	140J	ND (330)
Isophorone	4,400	ND (330)	ND (330)
2-Methylnaphthalene	36,400	120J	ND (330)
Naphthalene	13,000	290J	ND (330)
Nitrobenzene	200	ND (330)	ND (330)
2-Nitroaniline	430	ND (1,600)	ND (1,600)
3-Nitroaniline	500	ND (1,600)	ND (1,600)
4-Nitroaniline	NA	ND (1,600)	ND (1,600)
N-Nitrosodiphenylamine	NA	ND (330)	ND (330)
N-Nitroso-di-n-propylamine	NA	ND (330)	ND (330)
Phenanthrene	50,000	190J	ND (330)
Pyrene	50,000	210J	ND (330)
1,2,4-Trichlorobenzene	3,400	ND (330)	ND (330)
Acid Extractables (ug/kg)			
Benzoic acid	2,700	ND (1,600)	ND (1,600)
4-Chloro-3-methylphenol	240	ND (330)	ND (330)
2-Chlorophenol	800	ND (330)	ND (330)
2,4-Dichlorophenol	400	ND (330)	ND (330)
2,4-Dimethylphenol	NA	750	ND (330)
2,4-Dinitrophenol	200	ND (1,600)	ND (1,600)
4,6-Dinitro-2-methylphenol	NA	ND (1,600)	ND (1,600)
2-Methylphenol	100	570	ND (330)
4-Methylphenol	900	380	ND (330)
2-Nitrophenol	330	ND (330)	ND (330)
4-Nitrophenol	100	ND (1,600)	ND (1,600)
Pentachlorophenol	1,000	ND (1,600)	ND (1,600)
Phenol	30	270J	ND (330)
2,4,5-Trichlorophenol	100	ND (330)	ND (330)
2,4,6-Trichlorophenol	NA	ND (330)	ND (330)

TABLE A.9

SHALLOW SOIL SAMPLE RESULTS - TCL/TAL
JANUARY 1992 SAMPLING EVENT
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
LEICA INC.
CHEEKTOWAGA, NEW YORK

	NYS Cleanup Objective	*BH-G 4.0-6.0 Ft.*	*BH-Q 4.5-6.0 Ft.*
Pesticides and PCBs (ug/kg)			
alpha-BHC	110	ND (1.7)	ND (1.7)
beta-BHC	200	ND (1.7)	ND (1.7)
delta-BHC	300	ND (1.7)	ND (1.7)
Lindane	60	ND (1.7)	ND (1.7)
Heptachlor	100	ND (1.7)	ND (1.7)
Aldrin	41	ND (1.7)	ND (1.7)
Heptachlor epoxide	20	ND (1.7)	ND (1.7)
Endosulfan I	900	ND (1.7)	ND (1.7)
Dieldrin	44	ND (3.3)	ND (3.3)
4,4'-DDE	210	ND (3.3)	ND (3.3)
Endrin	100	ND (3.3)	ND (3.3)
Endosulfan II	900	ND (3.3)	ND (3.3)
4,4'-DDE	290	ND (3.3)	ND (3.3)
Endosulfan sulfate	1,000	ND (3.3)	ND (3.3)
4,4'-DDT	210	ND (3.3)	ND (3.3)
Methoxychlor	*	ND (17)	ND (17)
Endrin ketone	NA	ND (3.3)	ND (3.3)
alpha-Chlordane	540	ND (17)	ND (3.3)
gamma-Chlordane	540	ND (17)	ND (3.3)
Toxaphene	NA	ND (170)	ND (33)
Aroclor-1016	**	ND (17)	ND (17)
Aroclor-1221	**	ND (67)	ND (17)
Aroclor-1232	**	ND (17)	ND (17)
Aroclor-1242	**	ND (17)	ND (17)
Aroclor-1248	**	ND (17)	ND (17)
Aroclor-1254	**	ND (33)	ND (33)
Aroclor-1260	**	ND (33)	ND (33)

TABLE A.9

SHALLOW SOIL SAMPLE RESULTS - TCL/TAL
JANUARY 1992 SAMPLING EVENT
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
LEICA INC.
CHEEKTOWAGA, NEW YORK

	NYS Cleanup Objective	*BH-G 4.0-6.0 Ft.*	*BH-Q 4.5-6.0 Ft.*
Metals (mg/kg)			
Silver	SB	ND (0.5)	ND (0.5)
Aluminum	SB	9,400	8,600
Barium	300	100	76
Beryllium	0.16	0.6	0.4
Calcium	SB	61,000	63,000
Cadmium	1	ND (0.5)	ND (0.5)
Cobalt	30	6.2	7.5
Chromium	10	14	16
Copper	25	16	16
Iron	2,000	18,000	17,000
Potassium	SB	1,800	1,600
Magnesium	SB	16,000	16,000
Manganese	SB	470	420
Sodium	SB	380	410
Nickel	13	14	17
Antimony	SB	ND (10)	ND (10)
Vanadium	150	20	20
Zinc	20	58	96
Arsenic	7.5	1.4	1.4
Lead	SB ***	11	9
Mercury	0.1	ND (0.25)	ND (0.25)
Selenium	2	ND (0.5)	ND (0.5)
Thallium	SB	ND (0.5)	0.3J
Cyanide (total)	SB	ND (0.1)	ND (0.1)
TRPH	NA	2,200	140

Notes:

*	As per TAGM #4046, total pesticides <10 ppm
**	Total PCBs <10,000 (sub-surface)
***	4-61 ppm (rural), 200-500 ppm (suburban or metropolitan)
J	Estimated value - Result is less than detection limit
NA	Not Available
ND (X)	Not detected at stated method detection limit
PCBs	Polychlorinated Biphenyls
SB	Site Background
SVOCs	Semi-Volatile Organic Compounds
TRPH	Total Recoverable Petroleum Hydrocarbons
VOCs	Volatile Organic Compounds

TABLE A.10

DEEP SOIL SAMPLE RESULTS - TCL/TAL
JANUARY 1992 SAMPLING EVENT
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
LEICA INC.
CHEEKTOWAGA, NEW YORK

VOCs (ug/kg)	*NYS Cleanup Objective*	*MW-8 / BH-A 11.5-12.0 Ft.*	*MW-11 / BH-D 10.8-11.4 Ft.*	*MW-11 / BH-D 12.0-12.6 Ft.*	*MW-12 10.0-12.0 Ft.*	*BH-5 (Deep) 11.0-12.5 Ft. (NAPL in soil)*
Acetone	200	90B	ND (1,200)	ND (42,000)	ND (1,200)	ND (120,000)
Benzene	60	ND (33)	ND (1,200)	ND (42,000)	ND (1,200)	ND (120,000)
Bromodichloromethane	NA	ND (33)	ND (1,200)	ND (42,000)	ND (1,200)	ND (120,000)
Bromoform	NA	ND (33)	ND (1,200)	ND (42,000)	ND (1,200)	ND (120,000)
Bromomethane	NA	ND (33)	ND (1,200)	ND (42,000)	ND (1,200)	ND (120,000)
2-Butanone	300	ND (33)	ND (1,200)	ND (42,000)	ND (1,200)	ND (120,000)
Carbon Disulfide	2,700	ND (33)	ND (1,200)	ND (42,000)	ND (1,200)	ND (120,000)
Carbon Tetrachloride	600	ND (33)	ND (1,200)	ND (42,000)	ND (1,200)	ND (120,000)
Chlorobenzene	1,700	ND (33)	ND (1,200)	ND (42,000)	ND (1,200)	ND (120,000)
Chloroethane	1,900	ND (33)	ND (1,200)	ND (42,000)	ND (1,200)	ND (120,000)
Chloroform	300	ND (33)	ND (1,200)	ND (42,000)	ND (1,200)	ND (120,000)
Chloromethane	NA	ND (33)	ND (1,200)	ND (42,000)	ND (1,200)	ND (120,000)
Dibromochloromethane	NA	ND (33)	ND (1,200)	ND (42,000)	ND (1,200)	ND (120,000)
1,1-Dichloroethane	200	ND (33)	ND (1,200)	ND (42,000)	ND (1,200)	ND (120,000)
1,2-Dichloroethane	100	ND (33)	ND (1,200)	ND (42,000)	ND (1,200)	ND (120,000)
1,1-Dichloroethene	400	ND (33)	ND (1,200)	ND (42,000)	ND (1,200)	ND (120,000)
1,2-Dichloroethene (Total)	300	180	ND (1,200)	37,000J	260J	ND (120,000)
1,2-Dichloropropane	NA	ND (33)	ND (1,200)	ND (42,000)	ND (1,200)	ND (120,000)
cis-1,3-Dichloropropene	NA	ND (33)	ND (1,200)	ND (42,000)	ND (1,200)	ND (120,000)
trans-1,3-Dichloropropene	NA	ND (33)	ND (1,200)	ND (42,000)	ND (1,200)	ND (120,000)
Ethylbenzene	NA	ND (33)	ND (1,200)	ND (42,000)	ND (1,200)	ND (120,000)
2-Hexanone	NA	ND (33)	ND (1,200)	ND (42,000)	ND (1,200)	ND (120,000)
Methylene Chloride	100	ND (33)	ND (1,200)	ND (42,000)	ND (1,200)	ND (120,000)

TABLE A.10

DEEP SOIL SAMPLE RESULTS - TCL/TAL
JANUARY 1992 SAMPLING EVENT
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
LEICA INC.
CHEEKTOWAGA, NEW YORK

VOCs (ug/kg)	*NYS Cleanup Objective*	*MW-8 / BH-A 11.5-12.0 Ft.*	*MW-11 / BH-D 10.8-11.4 Ft.*	*MW-11 / BH-D 12.0-12.6 Ft.*	*MW-12 10.0-12.0 Ft.*	*BH-5 (Deep) 11.0-12.5 Ft. (NAPL in soil)*
4-Methyl-2-Pentanone	1,000	ND (33)	ND (1,200)	ND (42,000)	ND (1,200)	ND (120,000)
Styrene	NA	ND (33)	ND (1,200)	ND (42,000)	ND (1,200)	ND (120,000)
1,1,2,2-Tetrachloroethane	600	ND (33)	ND (1,200)	ND (42,000)	ND (1,200)	ND (120,000)
Tetrachloroethene	1,400	10J	ND (1,200)	ND (42,000)	ND (1,200)	ND (120,000)
Toluene	1,500	10J	ND (1,200)	ND (42,000)	ND (1,200)	ND (120,000)
1,1,1-Trichloroethane	800	ND (33)	ND (1,200)	ND (42,000)	ND (1,200)	ND (120,000)
1,1,2-Trichloroethane	NA	ND (33)	ND (1,200)	ND (42,000)	ND (1,200)	ND (120,000)
Trichloroethene	700	410	17,000	570,000	18,000	2,000,000
Vinyl Acetate	NA	ND (33)	ND (1,200)	ND (42,000)	ND (1,200)	ND (120,000)
Vinyl Chloride	200	ND (33)	ND (1,200)	ND (42,000)	ND (1,200)	ND (120,000)
Xylenes (Total)	1,200	880	1,600	58,000	ND (1,200)	64,000J
TRPH (mg/kg)	NA	9,000	83	NT	3,300	1,600

Notes:

B	Compound also detected in the method blank associated with this sample
J	Estimated value - Result is less than detection limit
NA	Not Available
ND(X)	Not detected at stated method detection limit
NT	Not Tested
TRPH	Total Recoverable Petroleum Hydrocarbons
VOCs	Volatile Organic Compounds

TABLE A.11

SHALLOW SOIL SAMPLE RESULTS
JANUARY 1992 SAMPLING EVENT
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
LEICA INC.
CHEEKTOWAGA, NEW YORK

Compound (mg/kg)	*BH-C 3.8-4.1 Ft.*	*BH-C (Dup) 3.8-4.1 Ft.*	*BH-G 4.0-6.0 Ft.*	*BH-N 0.5-1.5 Ft.*	*BH-P 2.0-4.0 Ft.*	*BH-Q 3.0-4.0 Ft.*	*BH-Q 4.5-6.0 Ft.*	*BH-R 2.0-4.0 Ft.*	*MW-11 / BH-D 4.0-6.0 Ft.*
TRPH	2000	3200	2200	750	820	14000	140	13000	240

Notes:

TRPH	Total Recoverable Petroleum Hydrocarbons

TABLE A.12
GROUNDWATER SAMPLE RESULTS
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
LEICA INC.
CHEEKTOWAGA, NEW YORK

		MW-4	*MW-4*	*MW-1*	*MW-4*	*MW-4 (Dup)*	*MW-5*	*MW-4*	*MW-6*
	NYS SCG	*5/91 (1020)*	*5/91 (1535)*	*07/01/91*	*07/02/91*	*07/03/91*	*07/04/91*	*01/01/92*	*01/01/92*
VOCs (ug/L)									
Acetone	50 (G)	ND (13,000)	ND (13,000)	ND (50)	ND (25,000)	ND (17,000)	ND (50)	ND (8,300)	ND (670)
Benzene	0.7 (S)	ND (1,300)	ND (1,300)	ND (5)	ND (2,500)	ND (1,700)	ND (5)	ND (8,300)	ND (670)
Bromodichloromethane	50 (G)	ND (1,300)	ND (1,300)	ND (5)	ND (2,500)	ND (1,700)	ND (5)	ND (8,300)	ND (670)
Bromoform	50 (G)	ND (1,300)	ND (1,300)	ND (5)	ND (2,500)	ND (1,700)	ND (5)	ND (8,300)	ND (670)
Bromomethane	5 (S)	ND (2,600)	ND (2,600)	ND (10)	ND (5,000)	ND (3,400)	ND (10)	ND (8,300)	ND (670)
2-Butanone	50 (G)	ND (13,000)	ND (13,000)	ND (50)	ND (25,000)	ND (17,000)	ND (50)	ND (8,300)	ND (670)
Carbon Disulfide	-	ND (1,300)	ND (1,300)	ND (5)	ND (2,500)	ND (1,700)	ND (5)	ND (8,300)	ND (670)
Carbon Tetrachloride	5 (S)	ND (1,300)	ND (1,300)	ND (5)	ND (2,500)	ND (1,700)	ND (5)	ND (8,300)	ND (670)
Chlorobenzene	5 (S)	ND (1,300)	ND (1,300)	ND (5)	ND (2,500)	ND (1,700)	ND (5)	ND (8,300)	ND (670)
Chloroethane	5 (S)	ND (2,600)	ND (2,600)	ND (10)	ND (5,000)	ND (3,400)	ND (10)	ND (8,300)	ND (670)
Chloroform	7 (S)	ND (1,300)	ND (1,300)	ND (5)	ND (2,500)	ND (1,700)	ND (5)	ND (8,300)	ND (670)
Chloromethane	-	ND (2,600)	ND (2,600)	ND (10)	ND (5,000)	ND (3,400)	ND (10)	ND (8,300)	ND (670)
Dibromochloromethane	50 (G)	ND (1,300)	ND (1,300)	ND (5)	ND (2,500)	ND (1,700)	ND (5)	ND (8,300)	ND (670)
1,1-Dichloroethane	5 (S)	ND (1,300)	ND (1,300)	ND (5)	ND (2,500)	ND (1,700)	ND (5)	ND (8,300)	ND (670)
1,2-Dichloroethane	5 (S)	ND (1,300)	ND (1,300)	ND (5)	ND (2,500)	ND (1,700)	ND (5)	ND (8,300)	ND (670)
1,1-Dichloroethene	5 (S)	ND (1,300)	ND (1,300)	ND (5)	ND (2,500)	ND (1,700)	ND (5)	ND (8,300)	ND (670)
1,2-Dichloroethene (Total)	5 (S)	42,000	52,000	ND (5)	49,000	47,000	ND (5)	64,000	5,800
1,2-Dichloropropane	5 (S)	ND (1,300)	ND (1,300)	ND (5)	ND (2,500)	ND (1,700)	ND (5)	ND (8,300)	ND (670)
cis-1,3-Dichloropropene	5 (S)	ND (1,300)	ND (1,300)	ND (5)	ND (2,500)	ND (1,700)	ND (5)	ND (8,300)	ND (670)
trans-1,3-Dichloropropene	5 (S)	ND (1,300)	ND (1,300)	ND (5)	ND (2,500)	ND (1,700)	ND (5)	ND (8,300)	ND (670)
Ethylbenzene	5 (S)	ND (1,300)	ND (1,300)	ND (5)	ND (2,500)	ND (1,700)	ND (5)	ND (8,300)	ND (670)
2-Hexanone	50 (G)	ND (13,000)	ND (13,000)	ND (50)	ND (25,000)	ND (17,000)	ND (50)	ND (8,300)	ND (670)
Methylene Chloride	5 (S)	ND (1,300)	ND (1,300)	ND (5)	ND (2,500)	ND (1,700)	ND (5)	ND (8,300)	ND (670)
4-Methyl-2-Pentanone	-	ND (13,000)	ND (13,000)	ND (50)	ND (25,000)	ND (17,000)	ND (50)	ND (8,300)	ND (670)
Styrene	5 (S)	ND (1,300)	ND (1,300)	ND (5)	ND (2,500)	ND (1,700)	ND (5)	ND (8,300)	ND (670)
1,1,2,2-Tetrachloroethane	5 (S)	ND (1,300)	ND (1,300)	ND (5)	ND (2,500)	ND (1,700)	ND (5)	ND (8,300)	ND (670)
Tetrachloroethene	5 (S)	ND (1,300)	ND (1,300)	ND (5)	ND (2,500)	ND (1,700)	ND (5)	ND (8,300)	ND (670)
Toluene	5 (S)	ND (1,300)	ND (1,300)	ND (5)	ND (2,500)	ND (1,700)	ND (5)	ND (8,300)	ND (670)
1,1,1-Trichloroethane	5 (S)	ND (1,300)	ND (1,300)	ND (5)	ND (2,500)	ND (1,700)	ND (5)	ND (8,300)	ND (670)
1,1,2-Trichloroethane	5 (S)	ND (1,300)	ND (1,300)	ND (5)	ND (2,500)	ND (1,700)	ND (5)	ND (8,300)	ND (670)
Trichloroethene	5 (S)	22,000	40,000	ND (5)	22,000	16,000	ND (5)	23,000	4,400
Vinyl Acetate	-	ND (13,000)	ND (13,000)	ND (50)	ND (2,500)	ND (1,700)	ND (50)	ND (8,300)	ND (670)
Vinyl Chloride	2 (S)	18,000	16,000	ND (10)	11,000	7,100	ND (10)	15,000	1,100
Xylenes (Total)	5 (S)	ND (1,300)	ND (1,300)	ND (5)	ND (2,500)	ND (1,700)	ND (5)	ND (8,300)	ND (670)

TABLE A.12
GROUNDWATER SAMPLE RESULTS
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
LEICA INC.
CHEEKTOWAGA, NEW YORK

	NYS SCG	*MW-4* *5/91 (1020)*	*MW-4* *5/91 (1535)*	*MW-1* *07/01/91*	*MW-4* *07/02/91*	*MW-4 (Dup)* *07/03/91*	*MW-5* *07/04/91*	*MW-4* *01/01/92*	*MW-6* *01/01/92*
SVOCs (ug/L)									
Acenaphthene	20 (G)	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthylene	-	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	50 (G)	NA	NA	NA	NA	NA	NA	NA	NA
Benzo (a) anthracene	0.002 (G)	NA	NA	NA	NA	NA	NA	NA	NA
Benzo (b) fluoranthene	0.002 (G)	NA	NA	NA	NA	NA	NA	NA	NA
Benzo (k) fluoranthene	0.002 (G)	NA	NA	NA	NA	NA	NA	NA	NA
Benzo (g,h,i) perylene	-	NA	NA	NA	NA	NA	NA	NA	NA
Benzo (a) pyrene	-	NA	NA	NA	NA	NA	NA	NA	NA
Benzyl alcohol	-	NA	NA	NA	NA	NA	NA	NA	NA
Bis (2-chloroethoxy) methane	-	NA	NA	NA	NA	NA	NA	NA	NA
Bis (2-chloroethyl) ether	1.0 (S)	NA	NA	NA	NA	NA	NA	NA	NA
Bis (2-chloroisopropyl) ether	-	NA	NA	NA	NA	NA	NA	NA	NA
Bis (2-ethylhexyl) phthalate	50 (S)	NA	NA	NA	NA	NA	NA	NA	NA
4-Bromophenyl phenyl ether	-	NA	NA	NA	NA	NA	NA	NA	NA
Butyl benzyl phthalate	50 (G)	NA	NA	NA	NA	NA	NA	NA	NA
4-Chloroaniline	-	NA	NA	NA	NA	NA	NA	NA	NA
2-Chloronaphthalene	10 (G)	NA	NA	NA	NA	NA	NA	NA	NA
4-Chlorophenyl phenyl ether	-	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	0.002 (G)	NA	NA	NA	NA	NA	NA	NA	NA
Dibenzo (a,h) anthracene	-	NA	NA	NA	NA	NA	NA	NA	NA
Dibenzofuran	-	NA	NA	NA	NA	NA	NA	NA	NA
Di-n-butyl phthalate	50 (S)	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichlorobenzene	4.7 (S)	NA	NA	NA	NA	NA	NA	NA	NA
1,3-Dichlorobenzene	5 (S)	NA	NA	NA	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	4.7 (S)	NA	NA	NA	NA	NA	NA	NA	NA
3,3'-Dichlorobenzidine	-	NA	NA	NA	NA	NA	NA	NA	NA
Diethyl phthalate	50 (G)	NA	NA	NA	NA	NA	NA	NA	NA
Dimethyl phthalate	50 (G)	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dinitrotoluene	-	NA	NA	NA	NA	NA	NA	NA	NA
2,6-Dinitrotoluene	5 (S)	NA	NA	NA	NA	NA	NA	NA	NA
Di-n-octyl phthalate	50 (G)	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	50 (G)	NA	NA	NA	NA	NA	NA	NA	NA
Fluorene	50 (G)	NA	NA	NA	NA	NA	NA	NA	NA
Hexachlorobenzene	0.35 (S)	NA	NA	NA	NA	NA	NA	NA	NA
Hexachlorobutadiene	5 (S)	NA	NA	NA	NA	NA	NA	NA	NA

TABLE A.12
GROUNDWATER SAMPLE RESULTS
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
LEICA INC.
CHEEKTOWAGA, NEW YORK

	NYS SCG	*MW-4* *5/91 (1020)*	*MW-4* *5/91 (1535)*	*MW-1* *07/01/91*	*MW-4* *07/02/91*	*MW-4 (Dup)* *07/03/91*	*MW-5* *07/04/91*	*MW-4* *01/01/92*	*MW-6* *01/01/92*
SVOCS Cont'd.									
Hexachlorocyclopentadiene	5 (S)	NA	NA	NA	NA	NA	NA	NA	NA
Hexachloroethane	-	NA	NA	NA	NA	NA	NA	NA	NA
Indeno (1,2,3-cd) pyrene	0.002 (G)	NA	NA	NA	NA	NA	NA	NA	NA
Isophorone	50 (G)	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	-	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	10 (G)	NA	NA	NA	NA	NA	NA	NA	NA
Nitrobenzene	5 (S)	NA	NA	NA	NA	NA	NA	NA	NA
2-Nitroaniline	-	NA	NA	NA	NA	NA	NA	NA	NA
3-Nitroaniline	-	NA	NA	NA	NA	NA	NA	NA	NA
4-Nitroaniline	-	NA	NA	NA	NA	NA	NA	NA	NA
N-Nitrosodiphenylamine	50 (G)	NA	NA	NA	NA	NA	NA	NA	NA
N-Nitroso-di-n-propylamine	-	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	50 (G)	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	50 (G)	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	5 (S)	NA	NA	NA	NA	NA	NA	NA	NA
Acid Extractables (ug/L)									
Benzoic acid	-	NA	NA	NA	NA	NA	NA	NA	NA
4-Chloro-3-methylphenol	1 (S) (1)	NA	NA	NA	NA	NA	NA	NA	NA
2-Chlorophenol	1 (S) (1)	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dichlorophenol	1 (S) (1)	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	5 (S) (2)	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dinitrophenol	5 (S) (2)	NA	NA	NA	NA	NA	NA	NA	NA
4,6-Dinitro-2-methylphenol	5 (S) (2)	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylphenol	5 (S) (2)	NA	NA	NA	NA	NA	NA	NA	NA
4-Methylphenol	5 (S) (2)	NA	NA	NA	NA	NA	NA	NA	NA
2-Nitrophenol	5 (S) (2)	NA	NA	NA	NA	NA	NA	NA	NA
4-Nitrophenol	5 (S) (2)	NA	NA	NA	NA	NA	NA	NA	NA
Pentachlorophenol	1 (S) (1)	NA	NA	NA	NA	NA	NA	NA	NA
Phenol	1 (S) (1)	NA	NA	NA	NA	NA	NA	NA	NA
2,4,5-Trichlorophenol	1 (S) (1)	NA	NA	NA	NA	NA	NA	NA	NA
2,4,6-Trichlorophenol	1 (S) (1)	NA	NA	NA	NA	NA	NA	NA	NA

TAB A.12
GROUNDWATER SAMPLE RESULTS
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
LEICA INC.
CHEEKTOWAGA, NEW YORK

	NYS SCG	*MW-4* *5/91 (1020)*	*MW-4* *5/91 (1535)*	*MW-1* *07/01/91*	*MW-4* *07/02/91*	*MW-4 (Dup)* *07/03/91*	*MW-5* *07/04/91*	*MW-4* *01/01/92*	*MW-6* *01/01/92*
Pesticides and PCBs (ug/L)									
alpha-BHC	-	NA	NA	NA	NA	NA	NA	NA	NA
beta-BHC	-	NA	NA	NA	NA	NA	NA	NA	NA
delta-BHC	-	NA	NA	NA	NA	NA	NA	NA	NA
Lindane	-	NA	NA	NA	NA	NA	NA	NA	NA
Heptachlor	-	NA	NA	NA	NA	NA	NA	NA	NA
Aldrin	-	NA	NA	NA	NA	NA	NA	NA	NA
Heptachlor epoxide	-	NA	NA	NA	NA	NA	NA	NA	NA
Endosulfan I	-	NA	NA	NA	NA	NA	NA	NA	NA
Dieldrin	-	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDE	-	NA	NA	NA	NA	NA	NA	NA	NA
Endrin	-	NA	NA	NA	NA	NA	NA	NA	NA
Endosulfan II	-	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDE	-	NA	NA	NA	NA	NA	NA	NA	NA
Endosulfan sulfate	-	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDT	-	NA	NA	NA	NA	NA	NA	NA	NA
Methoxychlor	35 (S)	NA	NA	NA	NA	NA	NA	NA	NA
Endrin ketone	-	NA	NA	NA	NA	NA	NA	NA	NA
alpha-Chlordane	0.1 (S)	NA	NA	NA	NA	NA	NA	NA	NA
gamma-Chlordane	0.1 (S)	NA	NA	NA	NA	NA	NA	NA	NA
Toxaphene	-	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1016	-	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1221	-	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1232	-	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1242	-	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1248	-	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1254	-	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1260	-	NA	NA	NA	NA	NA	NA	NA	NA
Metals (ug/L)									
Silver	50 (S)	NA	NA	NA	NA	NA	NA	NA	NA
Aluminum	-	NA	NA	NA	NA	NA	NA	NA	NA
Barium	1,000 (S)	NA	NA	NA	NA	NA	NA	NA	NA
Beryllium	3 (G)	NA	NA	NA	NA	NA	NA	NA	NA
Calcium	-	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	10 (S)	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt	-	NA	NA	NA	NA	NA	NA	NA	NA

TABLE A.12
GROUNDWATER SAMPLE RESULTS
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
LEICA INC.
CHEEKTOWAGA, NEW YORK

	NYS SCG	MW-4 5/91 (1020)	MW-4 5/91 (1535)	MW-1 07/01/91	MW-4 07/02/91	MW-4 (Dup) 07/03/91	MW-5 07/04/91	MW-4 01/01/92	MW-6 01/01/92
Metals (µg/L) Cont'd.)									
Chromium	50 (S)	NA	NA	NA	NA	NA	NA	NA	NA
Copper	200 (S)	NA	NA	NA	NA	NA	NA	NA	NA
Iron	300 (S) *	NA	NA	NA	NA	NA	NA	NA	NA
Potassium	-	NA	NA	NA	NA	NA	NA	NA	NA
Magnesium	35,000 (G)	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	300 (S) *	NA	NA	NA	NA	NA	NA	NA	NA
Sodium	20,000 (S)	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	-	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	3 (G)	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	-	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	300 (S)	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	25 (S)	NA	NA	NA	NA	NA	NA	NA	NA
Lead	25 (S)	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	2 (S)	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	10 (S)	NA	NA	NA	NA	NA	NA	NA	NA
Thallium	4 (G)	NA	NA	NA	NA	NA	NA	NA	NA
Cyanide (total)	100 (S)	NA	NA	NA	NA	NA	NA	NA	NA
TRPH (ppm)	-	NA	NA	NA	NA	NA	NA	NA	NA

Notes:

(1)	Refers to total phenols (Phenolic compounds)
(2)	Refers to total unchlorinated phenols
(G)	Guidance Value
(S)	Standard Value
*	Manganese and Iron < 500ug/L
-	Not Available
J	Estimated value - Result is less than detection limit
NA	Not Analyzed
ND (X)	Not detected at method detection limit shown
PCBs	Polychlorinated Biphenyls
SVOCs	Semi-Volatile Organic Compounds
TRPH	Total Recoverable Petroleum Hydrocarbons
VOCs	Volatile Organic Compounds

TAB[illegible].12
GROUNDWATER SAMPLE RESULTS
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
LEICA INC.
CHEEKTOWAGA, NEW YORK

	NYS SCG	*MW-7* *01/01/92*	*MW-8* *01/01/92*	*MW-8 (Dup)* *01/01/92*	*MW-9* *01/02/92*	*MW-10* *01/03/92*	*MW-11* *01/04/92*	*MW-12* *01/05/92*
VOCs (ug/L)								
Acetone	50 (G)	ND (330)	ND (25,000)	ND (25,000)	ND (77)	ND (6,200)	ND (25,000)	ND (5,000)
Benzene	0.7 (S)	110J	ND (25,000)	ND (25,000)	ND (77)	ND (6,200)	ND (25,000)	ND (5,000)
Bromodichloromethane	50 (G)	ND (330)	ND (25,000)	ND (25,000)	ND (77)	ND (6,200)	ND (25,000)	ND (5,000)
Bromoform	50 (G)	ND (330)	ND (25,000)	ND (25,000)	ND (77)	ND (6,200)	ND (25,000)	ND (5,000)
Bromomethane	5 (S)	ND (330)	ND (25,000)	ND (25,000)	ND (77)	ND (6,200)	ND (25,000)	ND (5,000)
2-Butanone	50 (G)	ND (330)	ND (25,000)	ND (25,000)	ND (77)	ND (6,200)	ND (25,000)	ND (5,000)
Carbon Disulfide	-	ND (330)	ND (25,000)	ND (25,000)	ND (77)	ND (6,200)	ND (25,000)	ND (5,000)
Carbon Tetrachloride	5 (S)	ND (330)	ND (25,000)	ND (25,000)	ND (77)	ND (6,200)	ND (25,000)	ND (5,000)
Chlorobenzene	5 (S)	ND (330)	ND (25,000)	ND (25,000)	ND (77)	ND (6,200)	ND (25,000)	ND (5,000)
Chloroethane	5 (S)	ND (330)	ND (25,000)	ND (25,000)	ND (77)	ND (6,200)	ND (25,000)	ND (5,000)
Chloroform	7 (S)	ND (330)	ND (25,000)	ND (25,000)	ND (77)	ND (6,200)	ND (25,000)	ND (5,000)
Chloromethane	-	ND (330)	ND (25,000)	ND (25,000)	ND (77)	ND (6,200)	ND (25,000)	ND (5,000)
Dibromochloromethane	50 (G)	ND (330)	ND (25,000)	ND (25,000)	ND (77)	ND (6,200)	ND (25,000)	ND (5,000)
1,1-Dichloroethane	5 (S)	ND (330)	ND (25,000)	ND (25,000)	ND (77)	ND (6,200)	ND (25,000)	ND (5,000)
1,2-Dichloroethane	5 (S)	ND (330)	ND (25,000)	ND (25,000)	ND (77)	ND (6,200)	ND (25,000)	ND (5,000)
1,1-Dichloroethene	5 (S)	ND (330)	ND (25,000)	ND (25,000)	ND (77)	ND (6,200)	ND (25,000)	ND (5,000)
1,2-Dichloroethene (Total)	5 (S)	5,500	300,000	430,000	600	74,000	370,000	5,200
1,2-Dichloropropane	5 (S)	ND (330)	ND (25,000)	ND (25,000)	ND (77)	ND (6,200)	ND (25,000)	ND (5,000)
cis-1,3-Dichloropropene	5 (S)	ND (330)	ND (25,000)	ND (25,000)	ND (77)	ND (6,200)	ND (25,000)	ND (5,000)
trans-1,3-Dichloropropene	5 (S)	ND (330)	ND (25,000)	ND (25,000)	ND (77)	ND (6,200)	ND (25,000)	ND (5,000)
Ethylbenzene	5 (S)	ND (330)	ND (25,000)	ND (25,000)	ND (77)	ND (6,200)	ND (25,000)	ND (5,000)
2-Hexanone	50 (G)	ND (330)	ND (25,000)	ND (25,000)	ND (77)	ND (6,200)	ND (25,000)	ND (5,000)
Methylene Chloride	5 (S)	ND (330)	ND (25,000)	ND (25,000)	ND (77)	ND (6,200)	ND (25,000)	ND (5,000)
4-Methyl-2-Pentanone	-	ND (330)	ND (25,000)	ND (25,000)	ND (77)	ND (6,200)	ND (25,000)	ND (5,000)
Styrene	5 (S)	ND (330)	ND (25,000)	ND (25,000)	ND (77)	ND (6,200)	ND (25,000)	ND (5,000)
1,1,2,2-Tetrachloroethane	5 (S)	ND (330)	ND (25,000)	ND (25,000)	ND (77)	ND (6,200)	ND (25,000)	ND (5,000)
Tetrachloroethene	5 (S)	ND (330)	ND (25,000)	ND (25,000)	ND (77)	ND (6,200)	ND (25,000)	ND (5,000)
Toluene	5 (S)	ND (330)	ND (25,000)	ND (25,000)	ND (77)	ND (6,200)	ND (25,000)	ND (5,000)
1,1,1-Trichloroethane	5 (S)	ND (330)	ND (25,000)	ND (25,000)	ND (77)	ND (6,200)	ND (25,000)	ND (5,000)
1,1,2-Trichloroethane	5 (S)	ND (330)	ND (25,000)	ND (25,000)	ND (77)	ND (6,200)	ND (25,000)	ND (5,000)
Trichloroethene	5 (S)	ND (330)	110,000	150,000	160	93,000	350,000	54,000
Vinyl Acetate	-	ND (330)	ND (25,000)	ND (25,000)	ND (77)	ND (6,200)	ND (25,000)	ND (5,000)
Vinyl Chloride	2 (S)	2,100	31,000	46,000	99	9,700	51,000	ND (1,000)
Xylenes (Total)	5 (S)	ND (330)	ND (25,000)	ND (25,000)	ND (77)	ND (6,200)	ND (25,000)	ND (5,000)

TABLE A.12
GROUNDWATER SAMPLE RESULTS
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
LEICA INC.
CHEEKTOWAGA, NEW YORK

	NYS SCG	*MW-7* *01/01/92*	*MW-8* *01/01/92*	*MW-8 (Dup)* *01/01/92*	*MW-9* *01/02/92*	*MW-10* *01/03/92*	*MW-11* *01/04/92*	*MW-12* *01/05/92*
SVOCs (ug/L)								
Acenaphthene	20 (G)	NA	NA	NA	NA	NA	ND (50)	NA
Acenaphthylene	-	NA	NA	NA	NA	NA	ND (50)	NA
Anthracene	50 (G)	NA	NA	NA	NA	NA	ND (50)	NA
Benzo (a) anthracene	0.002 (G)	NA	NA	NA	NA	NA	ND (50)	NA
Benzo (b) fluoranthene	0.002 (G)	NA	NA	NA	NA	NA	ND (50)	NA
Benzo (k) fluoranthene	0.002 (G)	NA	NA	NA	NA	NA	ND (50)	NA
Benzo (g,h,i) perylene	-	NA	NA	NA	NA	NA	ND (50)	NA
Benzo (a) pyrene	-	NA	NA	NA	NA	NA	ND (50)	NA
Benzyl alcohol	-	NA	NA	NA	NA	NA	ND (50)	NA
Bis (2-chloroethoxy) methane	-	NA	NA	NA	NA	NA	ND (50)	NA
Bis (2-chloroethyl) ether	1.0 (S)	NA	NA	NA	NA	NA	ND (50)	NA
Bis (2-chloroisopropyl) ether	-	NA	NA	NA	NA	NA	ND (50)	NA
Bis (2-ethylhexyl) phthalate	50 (S)	NA	NA	NA	NA	NA	ND (50)	NA
4-Bromophenyl phenyl ether	-	NA	NA	NA	NA	NA	ND (50)	NA
Butyl benzyl phthalate	50 (G)	NA	NA	NA	NA	NA	ND (50)	NA
4-Chloroaniline	-	NA	NA	NA	NA	NA	ND (50)	NA
2-Chloronaphthalene	10 (G)	NA	NA	NA	NA	NA	ND (50)	NA
4-Chlorophenyl phenyl ether	-	NA	NA	NA	NA	NA	ND (50)	NA
Chrysene	0.002 (G)	NA	NA	NA	NA	NA	ND (50)	NA
Dibenzo (a,h) anthracene	-	NA	NA	NA	NA	NA	ND (50)	NA
Dibenzofuran	-	NA	NA	NA	NA	NA	ND (50)	NA
Di-n-butyl phthalate	50 (S)	NA	NA	NA	NA	NA	ND (50)	NA
1,2-Dichlorobenzene	4.7 (S)	NA	NA	NA	NA	NA	ND (50)	NA
1,3-Dichlorobenzene	5 (S)	NA	NA	NA	NA	NA	ND (50)	NA
1,4-Dichlorobenzene	4.7 (S)	NA	NA	NA	NA	NA	ND (50)	NA
3,3'-Dichlorobenzidine	-	NA	NA	NA	NA	NA	ND (100)	NA
Diethyl phthalate	50 (G)	NA	NA	NA	NA	NA	ND (50)	NA
Dimethyl phthalate	50 (G)	NA	NA	NA	NA	NA	ND (50)	NA
2,4-Dinitrotoluene	-	NA	NA	NA	NA	NA	ND (50)	NA
2,6-Dinitrotoluene	5 (S)	NA	NA	NA	NA	NA	ND (50)	NA
Di-n-octyl phthalate	50 (G)	NA	NA	NA	NA	NA	ND (50)	NA
Fluoranthene	50 (G)	NA	NA	NA	NA	NA	ND (50)	NA
Fluorene	50 (G)	NA	NA	NA	NA	NA	ND (50)	NA
Hexachlorobenzene	0.35 (S)	NA	NA	NA	NA	NA	ND (50)	NA
Hexachlorobutadiene	5 (S)	NA	NA	NA	NA	NA	ND (50)	NA

TAB[illegible].12
GROUNDWATER SAMPLE RESULTS
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
LEICA INC.
CHEEKTOWAGA, NEW YORK

	NYS SCG	*MW-7* *01/01/92*	*MW-8* *01/01/92*	*MW-8 (Dup)* *01/01/92*	*MW-9* *01/02/92*	*MW-10* *01/03/92*	*MW-11* *01/04/92*	*MW-12* *01/05/92*
SVOCS Cont'd.								
Hexachlorocyclopentadiene	5 (S)	NA	NA	NA	NA	NA	ND (50)	NA
Hexachloroethane	-	NA	NA	NA	NA	NA	ND (50)	NA
Indeno (1,2,3-cd) pyrene	0.002 (G)	NA	NA	NA	NA	NA	ND (50)	NA
Isophorone	50 (G)	NA	NA	NA	NA	NA	ND (50)	NA
2-Methylnaphthalene	-	NA	NA	NA	NA	NA	ND (50)	NA
Naphthalene	10 (G)	NA	NA	NA	NA	NA	24J	NA
Nitrobenzene	5 (S)	NA	NA	NA	NA	NA	ND (50)	NA
2-Nitroaniline	-	NA	NA	NA	NA	NA	ND (250)	NA
3-Nitroaniline	-	NA	NA	NA	NA	NA	ND (250)	NA
4-Nitroaniline	-	NA	NA	NA	NA	NA	ND (250)	NA
N-Nitrosodiphenylamine	50 (G)	NA	NA	NA	NA	NA	ND (50)	NA
N-Nitroso-di-n-propylamine	-	NA	NA	NA	NA	NA	ND (50)	NA
Phenanthrene	50 (G)	NA	NA	NA	NA	NA	ND (50)	NA
Pyrene	50 (G)	NA	NA	NA	NA	NA	ND (50)	NA
1,2,4-Trichlorobenzene	5 (S)	NA	NA	NA	NA	NA	ND (50)	NA
Acid Extractables (ug/L)								
Benzoic acid	-	NA	NA	NA	NA	NA	ND (250)	NA
4-Chloro-3-methylphenol	1 (S) (1)	NA	NA	NA	NA	NA	ND (50)	NA
2-Chlorophenol	1 (S) (1)	NA	NA	NA	NA	NA	ND (50)	NA
2,4-Dichlorophenol	1 (S) (1)	NA	NA	NA	NA	NA	ND (50)	NA
2,4-Dimethylphenol	5 (S) (2)	NA	NA	NA	NA	NA	38J	NA
2,4-Dinitrophenol	5 (S) (2)	NA	NA	NA	NA	NA	ND (250)	NA
4,6-Dinitro-2-methylphenol	5 (S) (2)	NA	NA	NA	NA	NA	ND (250)	NA
2-Methylphenol	5 (S) (2)	NA	NA	NA	NA	NA	65	NA
4-Methylphenol	5 (S) (2)	NA	NA	NA	NA	NA	550	NA
2-Nitrophenol	5 (S) (2)	NA	NA	NA	NA	NA	ND (50)	NA
4-Nitrophenol	5 (S) (2)	NA	NA	NA	NA	NA	ND (250)	NA
Pentachlorophenol	1 (S) (1)	NA	NA	NA	NA	NA	ND (250)	NA
Phenol	1 (S) (1)	NA	NA	NA	NA	NA	980	NA
2,4,5-Trichlorophenol	1 (S) (1)	NA	NA	NA	NA	NA	ND (50)	NA
2,4,6-Trichlorophenol	1 (S) (1)	NA	NA	NA	NA	NA	ND (50)	NA

TABLE A.12
GROUNDWATER SAMPLE RESULTS
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
LEICA INC.
CHEEKTOWAGA, NEW YORK

	NYS SCG	*MW-7* *01/01/92*	*MW-8* *01/01/92*	*MW-8 (Dup)* *01/01/92*	*MW-9* *01/02/92*	*MW-10* *01/03/92*	*MW-11* *01/04/92*	*MW-12* *01/05/92*
Pesticides and PCBs (ug/L)								
alpha-BHC	-	NA	NA	NA	NA	NA	ND (0.05)	NA
beta-BHC	-	NA	NA	NA	NA	NA	ND (0.05)	NA
delta-BHC	-	NA	NA	NA	NA	NA	ND (0.05)	NA
Lindane	-	NA	NA	NA	NA	NA	ND (0.05)	NA
Heptachlor	-	NA	NA	NA	NA	NA	ND (0.05)	NA
Aldrin	-	NA	NA	NA	NA	NA	ND (0.05)	NA
Heptachlor epoxide	-	NA	NA	NA	NA	NA	ND (0.05)	NA
Endosulfan I	-	NA	NA	NA	NA	NA	ND (0.05)	NA
Dieldrin	-	NA	NA	NA	NA	NA	ND (0.1)	NA
4,4'-DDE	-	NA	NA	NA	NA	NA	ND (0.1)	NA
Endrin	-	NA	NA	NA	NA	NA	ND (0.1)	NA
Endosulfan II	-	NA	NA	NA	NA	NA	ND (0.1)	NA
4,4'-DDE	-	NA	NA	NA	NA	NA	ND (0.1)	NA
Endosulfan sulfate	-	NA	NA	NA	NA	NA	ND (0.1)	NA
4,4'-DDT	-	NA	NA	NA	NA	NA	ND (0.1)	NA
Methoxychlor	35 (S)	NA	NA	NA	NA	NA	ND (0.5)	NA
Endrin ketone	-	NA	NA	NA	NA	NA	ND (0.1)	NA
alpha-Chlordane	0.1 (S)	NA	NA	NA	NA	NA	ND (0.1)	NA
gamma-Chlordane	0.1 (S)	NA	NA	NA	NA	NA	ND (0.1)	NA
Toxaphene	-	NA	NA	NA	NA	NA	ND (5)	NA
Aroclor-1016	-	NA	NA	NA	NA	NA	ND (0.1)	NA
Aroclor-1221	-	NA	NA	NA	NA	NA	ND (0.1)	NA
Aroclor-1232	-	NA	NA	NA	NA	NA	ND (0.1)	NA
Aroclor-1242	-	NA	NA	NA	NA	NA	ND (0.1)	NA
Aroclor-1248	-	NA	NA	NA	NA	NA	ND (0.1)	NA
Aroclor-1254	-	NA	NA	NA	NA	NA	ND (0.1)	NA
Aroclor-1260	-	NA	NA	NA	NA	NA	ND (0.1)	NA
Metals (ug/L)								
Silver	50 (S)	NA	NA	NA	NA	NA	ND (10)	NA
Aluminum	-	NA	NA	NA	NA	NA	5,000	NA
Barium	1,000 (S)	NA	NA	NA	NA	NA	270	NA
Beryllium	3 (G)	NA	NA	NA	NA	NA	ND (5)	NA
Calcium	-	NA	NA	NA	NA	NA	380,000	NA
Cadmium	10 (S)	NA	NA	NA	NA	NA	ND (5)	NA
Cobalt	-	NA	NA	NA	NA	NA	ND (50)	NA

TAB[illegible].12
GROUNDWATER SAMPLE RESULTS
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
LEICA INC.
CHEEKTOWAGA, NEW YORK

	NYS SCG	*MW-7* *01/01/92*	*MW-8* *01/01/92*	*MW-8 (Dup)* *01/01/92*	*MW-9* *01/02/92*	*MW-10* *01/03/92*	*MW-11* *01/04/92*	*MW-12* *01/05/92*
Metals (ug/L) Cont'd.)								
Chromium	50 (S)	NA	NA	NA	NA	NA	30	NA
Copper	200 (S)	NA	NA	NA	NA	NA	22	NA
Iron	300 (S) *	NA	NA	NA	NA	NA	10,000	NA
Potassium	-	NA	NA	NA	NA	NA	11,000	NA
Magnesium	35,000 (G)	NA	NA	NA	NA	NA	310,000	NA
Manganese	300 (S) *	NA	NA	NA	NA	NA	450	NA
Sodium	20,000 (S)	NA	NA	NA	NA	NA	490,000	NA
Nickel	-	NA	NA	NA	NA	NA	ND (40)	NA
Antimony	3 (G)	NA	NA	NA	NA	NA	ND (60)	NA
Vanadium	-	NA	NA	NA	NA	NA	ND (50)	NA
Zinc	300 (S)	NA	NA	NA	NA	NA	320	NA
Arsenic	25 (S)	NA	NA	NA	NA	NA	7	NA
Lead	25 (S)	NA	NA	NA	NA	NA	6	NA
Mercury	2 (S)	NA	NA	NA	NA	NA	ND (0.2)	NA
Selenium	10 (S)	NA	NA	NA	NA	NA	ND (5)	NA
Thallium	4 (G)	NA	NA	NA	NA	NA	ND (10)	NA
Cyanide (total)	100 (S)	NA	NA	NA	NA	NA	ND (5)	NA
TRPH (ppm)	-	1.2	NA	NA	NA	2.2	8	NA

Notes:

(1)	Refers to total phenols (Phenolic compounds)
(2)	Refers to total unchlorinated phenols
(G)	Guidance Value
(S)	Standard Value
*	Manganese and Iron < 500ug/L
-	Not Available
J	Estimated value - Result is less than detection limit
NA	Not Analyzed
ND (X)	Not detected at method detection limit shown
PCBs	Polychlorinated Biphenyls
SVOCs	Semi-Volatile Organic Compounds
TRPH	Total Recoverable Petroleum Hydrocarbons
VOCs	Volatile Organic Compounds

TABLE A.13

PLATING ROOM ANALYTICAL RESULTS
STORM SEWER ANALYTICAL RESULTS
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
LEICA INC.
CHEEKTOWAGA, NEW YORK

Analyte (mg/kg)	*PR-1 10/17/90*	*PR-2 10/17/90*	*SS-1 10/17/90*	*SS-2 10/17/90*	*SS-1 (Water) * 10/17/90*	*SS-2 (Water) * 10/17/90*
Total Cadmium	81	37	1180	7.2	0.012	0.014
Total Chromium	41	446	746	68	0.024	0.023
Total Nickel	2680	508	1406	48	0.16	0.06
Total Zinc	3060	1060	3160	1160	0.16	0.049
Hexavalent Chromium	0.14	1.8	0.082	0.12	NA	NA
Total Cyanide	2.8	5.1	0.4	1.1	NA	NA
pH (Leachable)	8.44	7.94	6.53	7.45	NA	NA

Notes:

NA	Not analyzed
*	Results in mg/L

TABLE A.14
TRANSFORMER AREA / MACHINING AREA WIPE SAMPLE RESULTS
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
LEICA INC.
CHEEKTOWAGA, NEW YORK

Compound *(ug/kg)*	*T-1A* *10/17/90*	*T-1B* *10/17/90*	*W-1* *10/17/90*	*W-2* *10/17/90*	*MW-1 *** *10/17/90*	*MW-2 *** *10/17/90*	*T-2 *** *10/17/90*	*T-3 *** *10/17/90*
Aroclor 1016	ND (48)	ND (48)	ND (9000)*	ND (6000)*	ND (100)*	ND (10)	ND (40)	ND (40)
Aroclor 1221	ND (48)	ND (48)	ND (9000)*	ND (6000)*	ND (100)*	ND (10)	ND (40)	ND (40)
Aroclor 1232	ND (48)	ND (48)	ND (9000)*	ND (6000)*	ND (100)*	ND (10)	ND (40)	ND (40)
Aroclor 1242	ND (48)	ND (48)	ND (9000)*	ND (6000)*	ND (100)*	ND (10)	ND (40)	ND (40)
Aroclor 1248	ND (48)	ND (48)	ND (9000)*	ND (6000)*	ND (100)*	ND (10)	ND (40)	ND (40)
Aroclor 1254	ND (97)	ND (96)	ND (18000)*	ND (12000)*	ND (200)*	ND (20)	ND (80)	ND (80)
Aroclor 1260	ND (97)	ND (82)J	ND (18000)*	ND (12000)*	ND (200)*	ND (20)	ND (33)J	84

<u>Location Key</u>

Outside Transformer Area: T-1A, T-1B
Inside Transformer: T-2, T-3
Machining Area: W-1, W-2, MW-1, MW-2

Notes:

* Elevated detection limits are the result of a dilution necessitated by sample matrix.
** Units are ug/wipe.

B

APPENDIX B

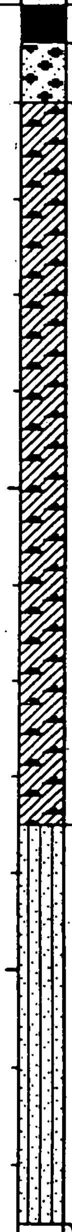
STRATIGRAPHIC AND INSTRUMENTATION LOGS

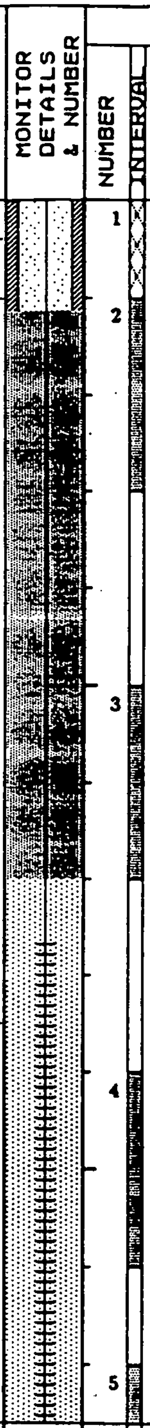
BOREHOLE LOG	**PROJECT:** 90-821	**BOREHOLE:** MW1

PHASE II SUBSOIL INVESTIGATION
CHEEKTOWAGA, NEW YORK
FOR: Leica Inc.

DATE: 23 November 1990
GEOLOGIST TEJ

REFERENCE POINT (Top of Riser) 662.38
GROUND SURFACE 662.53





DEPTH (ft)	STRATIGRAPHIC DESCRIPTION	SAMPLE NUMBER	TYPE	N VALUE	% WATER	% REC.	% RQD	COMMENTS
0.4	**ASPHALT**	1	GS					
1.0	**SUB-BASE** Grey sandy gravel.	2	SS	7		0		NO RECOVERY DURING THIS INTERVAL
	SILTY CLAY TILL Grey silty clay, trace ~~fine sand~~, DTPL, stiff. -Interlaminated with red silty seams throughout.							
		3	SS	10		60		OVA rdg.= NIL
8.5	**SILTY SAND** Brownish grey silty fine sand, trace fine gravel, saturated, loose.	4	SS	9		25		OVA rdg.= NIL
12.6	-Occasional limestone fragments encountered at bottom of hole.	5	SS	50/ 1in.				OVA rdg.= NIL
	Borehole terminated at 12.6 ft in silty sand.							AUGER REFUSAL AT 12.6 FT.

NOTE: ELEVATION RESURVEYED MARCH 1994.

Gartner Lee Inc.

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

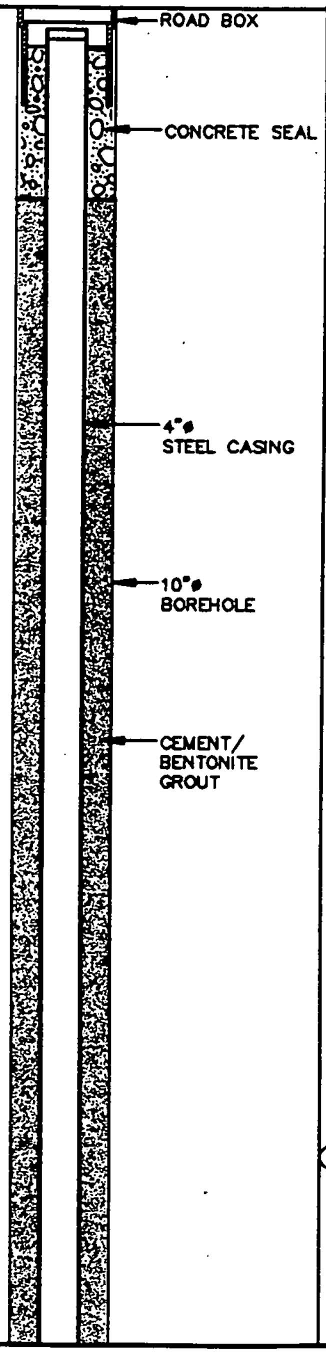
(L-64)

PROJECT NAME: LEICA INC. RI/FS
PROJECT NO.: 3967
CLIENT: LEICA INC.
LOCATION: CHEEKTOWAGA, NEW YORK

HOLE DESIGNATION: MW-1A (Page 1 of 5)
DATE COMPLETED: MARCH 31, 1994
DRILLING METHOD: 6 5/8" ID HSA
CRA SUPERVISOR: K. LYNCH

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE	SAMPLE PID (ppm)
	REFERENCE POINT (Top of Riser) GROUND SURFACE	663.48 664.0				
	Augered through asphalt and gravel					
1.0	SP-SAND(FILL), some fine to medium gravel, little silt, brown and gray, moist to wet	663.0				
2.0			1SS		11	0
	ML-SILT(NATIVE), little to some clay, little sand, trace fine subrounded gravel, stiff, red brown, dry to moist	661.6				
3.0						
4.0			2SS		40	0
5.0						
6.0			GS 3SS		34	0
7.0						
8.0			4SS		15	0.1
9.0	SM-SAND, fine to medium grained, brown to gray, moist to wet	655.2				
10.0			GS 5SS		24	0.1
11.0						
12.0			6SS		42	0
	SP-SAND(TILL), some fine to medium subround to subangular gravel, dense, gray, dry to moist	651.7				
13.0			GS 7SS		>50	0.1

MONITOR INSTALLATION



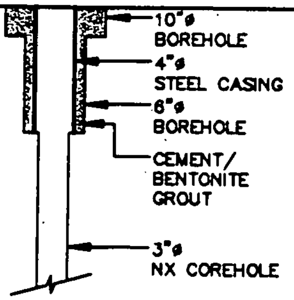
NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
GRAIN SIZE ANALYSIS GS
CHEMICAL ANALYSIS ○ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG
(OVERBURDEN)

(L-64)

PROJECT NAME: LEICA INC. RI/FS
PROJECT NO.: 3967
CLIENT: LEICA INC.
LOCATION: CHEEKTOWAGA, NEW YORK

HOLE DESIGNATION: MW-1A
(Page 2 of 5)
DATE COMPLETED: MARCH 31, 1994
DRILLING METHOD: 6 5/8" ID HSA
CRA SUPERVISOR: K. LYNCH

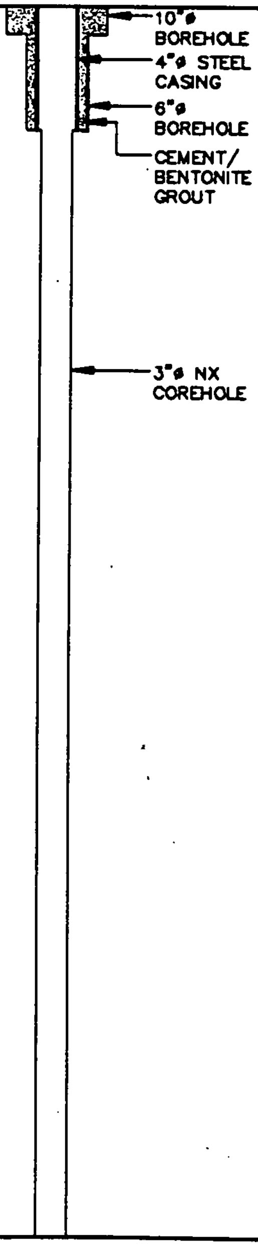
DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE	SAMPLE PID (ppm)
	BEDROCK – wet rotary to 14.3 ft BGS	650.7					
14.0							
	END OF OVERBURDEN HOLE @ 14.3 FT BGS NOTES: 1. At completion a 4" steel casing was installed to 14.3 ft. BGS for bedrock drilling. 2. Bulk soil samples collected from 5.0 to 7.0, 9.0 to 11.0 and 12.5 to 13.3 ft BGS for grain size analysis. 3. Soil sample retained for chemical analysis of TCL VOCs.	649.7					
15.0							
16.0							
17.0							
18.0							
19.0							
20.0							
21.0							
22.0							
23.0							
24.0							
25.0							
26.0							

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
GRAIN SIZE ANALYSIS GS ◯
CHEMICAL ANALYSIS ◯ WATER FOUND ▽ STATIC WATER LEVEL ▼

(L-65)

STRATIGRAPHIC AND INSTRUMENTATION LOG
(BEDROCK)

PROJECT NAME:	LEICA INC, RI/FS	HOLE DESIGNATION:	MW-1A (Page 3 of 5)
PROJECT NO.:	3967	DATE COMPLETED:	MARCH 31, 1994
CLIENT:	LEICA INC.	DRILLING METHOD:	6 5/8" ID HSA
LOCATION:	CHEEKTOWAGA, NEW YORK	CRA SUPERVISOR:	K. LYNCH

DEPTH	DESCRIPTION OF STRATA	ELEVATION	MONITOR INSTALLATION	BEDROCK INTERVAL	RUN NUMBER	CORE RECOVERY	RQD	WATER RETURN
ft BGS		ft. AMSL				%	%	%
	Overburden							
14.0	LIMESTONE(Onondaga Formation, Moorehouse Member): light gray, fine to coarse grained, slightly to heavily weathered, trace vertical fractures, massively bedded, trace coral, some chert, stylolites, some carbonaceous partings	650.7			WR			
15.0	– moderately weathered carbonaceous parting (@ 15.2 and 15.5 ft BGS) – dark chert (15.2 to 15.7 ft BGS)							
16.0	– carbonaceous parting (@ 15.9, 16.0, 16.2, 16.8 and 17.0 ft BGS)							
17.0	– brachiopod (@ 17.1 ft BGS)							
18.0	– weathered joint (@ 18.0 ft BGS)				1	100	69.0	80
	– carbonaceous parting (@ 18.4, 19.4 and 19.7 ft BGS)							
19.0								
20.0	– moderately weathered zone, vertical fracture (19.7 to 20.5 ft BGS)							
21.0	– moderately weathered break (20.7 and 22.1 ft BGS)							
22.0								
23.0	– small closed fracture, small crystal lined vug (@ 22.3 ft BGS) – dark chert zone (22.6 to 22.7 and 23.1 to 23.3 ft BGS)							
24.0	– slightly weathered vertical fracture (23.6 to 24.2 ft BGS)				2	100	71.0	0
	– dark chert layers interspersed with limestone (24.2 to 25.4 ft BGS) – rubble zone, moderately weathered (24.6 to 24.9 ft BGS)							
25.0								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

▽ WATER FOUND   ▼ STATIC WATER LEVEL   NM – NOT MEASURED

STRATIGRAPHIC AND INSTRUMENTATION LOG
(BEDROCK)

(L-65)

PROJECT NAME: LEICA INC, RI/FS
PROJECT NO.: 3967
CLIENT: LEICA INC.
LOCATION: CHEEKTOWAGA, NEW YORK

HOLE DESIGNATION: MW-1A (Page 4 of 5)
DATE COMPLETED: MARCH 31, 1994
DRILLING METHOD: 6 5/8" ID HSA
CRA SUPERVISOR: K. LYNCH

DEPTH	DESCRIPTION OF STRATA	ELEVATION	MONITOR INSTALLATION	BEDROCK INTERVAL	RUN NUMBER	CORE RECOVERY	RQD	WATER RETURN
ft BGS		ft. AMSL				%	%	%
	– coral (25.5 to 25.6 ft BGS) – stylolite (@ 25.6 ft BGS)							
26.0	– dark chert (25.6 to 25.8 ft BGS) – trace coral and solution pitting (26.3 to 26.5 ft BGS)							
27.0	– small calcite mass (@ 26.5 ft BGS) – dark chert zone (26.9 to 27.1 and 27.3 to 27.6 ft BGS)							
28.0	– coral between moderately weathered breaks (27.7 to 27.8 ft BGS) – closed vertical fracture (28.2 to 28.5 ft BGS)				2	100	71.0	0
29.0								
30.0	– gray and buff colored chert (28.7 to to 29.6 ft BGS) – rugose coral outline (29.8 to 29.9 ft BGS)							
31.0	– weathered break (@ 30.5 ft BGS) – buff colored chert (30.5 to 31.0 ft BGS) – weathered coral (31.4 to 31.8 ft BGS)		3"ø NX COREHOLE					
32.0								
33.0	– dark chert (32.7 to 33.5 ft BGS)							
34.0	– slightly weathered carbonaceous parting (@ 33.5 ft BGS) – abundant light gray and buff colored chert (34.0 to 38.7 ft BGS)							
35.0					3	100	86.0	0
36.0								
37.0								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

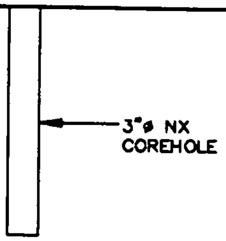
▽ WATER FOUND ▼ STATIC WATER LEVEL NM – NOT MEASURED

STRATIGRAPHIC AND INSTRUMENTATION LOG (BEDROCK)

(L-65)

PROJECT NAME: LEICA INC, RI/FS
PROJECT NO.: 3967
CLIENT: LEICA INC.
LOCATION: CHEEKTOWAGA, NEW YORK

HOLE DESIGNATION: MW-1A (Page 5 of 5)
DATE COMPLETED: MARCH 31, 1994
DRILLING METHOD: 6 5/8" ID HSA
CRA SUPERVISOR: K. LYNCH

DEPTH	DESCRIPTION OF STRATA	ELEVATION	MONITOR INSTALLATION	BEDROCK INTERVAL	RUN NUMBER	CORE RECOVERY	RQD	WATER RETURN
ft BGS		ft. AMSL				%	%	%
	– brachiopod (@ 37.4 ft BGS) – moderately weathered break (@ 37.5 ft BGS)				3	100	86.0	0
38.0								
39.0	– carbonaceous parting (@ 39.0 and 39.4 ft BGS)							
	END OF HOLE @ 39.4 FT. BGS	624.6						
40.0								
41.0								
42.0								
43.0								
44.0								
45.0								
46.0								
47.0								
48.0								
49.0								

BOREHOLE LOG

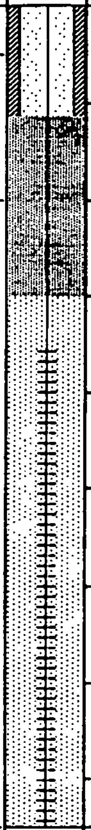
PROJECT: 90-821

BOREHOLE: MW2

PHASE II SUBSOIL INVESTIGATION
CHEEKTOWAGA, NEW YORK
FOR: Leica Inc.

DATE: 23 November 1990
GEOLOGIST TEJ

STRATIGRAPHIC DESCRIPTION
REFERENCE POINT (Top of Riser) 657.01
GROUND SURFACE 657.45



DEPTH (ft)	STRATIGRAPHIC DESCRIPTION	SAMPLE NUMBER	SAMPLE INTERVAL	SAMPLE TYPE	SAMPLE N VALUE	SAMPLE % WATER	SAMPLE % REC	SAMPLE % RQD	COMMENTS
0.5	**TOPSOIL** Dark brown silty clay with rootlets and organic matter, moist.			SS	6		80		NO READINGS TAKEN
2.0	**SILTY CLAY TILL** Brown silty clay, trace fine sand, DTPL, firm.								
	SILTY SAND Brown silty fine sand, trace fine gravel, moist becoming saturated below about 6.0 ft, compact.								
	-Trace orange colored staining observed between about 4.0 and 5.0 ft.			SS	14		75		
6.0	-Becoming a sand and gravel below about 6.0 ft.			SS	50/ 1in.		16		
8.5	-Occasional limestone and chert fragments observed at bottom of hole.								
	Borehole terminated at 8.5 ft in sand and gravel. NOTE: ELEVATION RESURVEYED MARCH 1994.								AUGER REFUSAL AT 8.5 FT.

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(L-66)

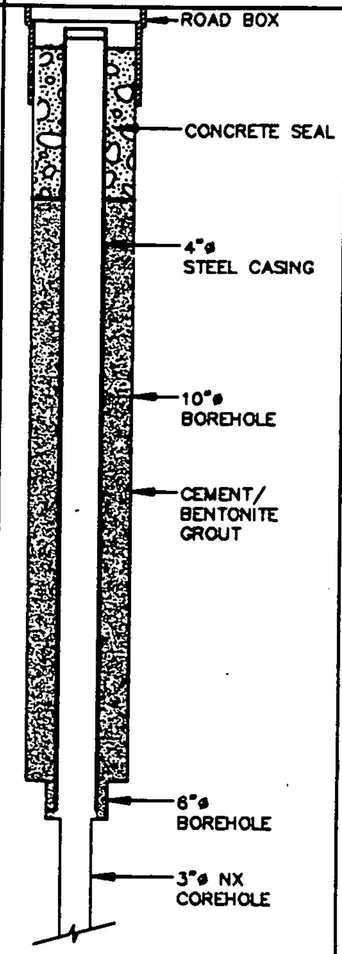
PROJECT NAME: LEICA INC. RI/FS
PROJECT NO.: 3967
CLIENT: LEICA INC.
LOCATION: CHEEKTOWAGA, NEW YORK

HOLE DESIGNATION: MW-2A (Page 1 of 3)
DATE COMPLETED: NOVEMBER 30, 1993
DRILLING METHOD: 8 1/4" ID HSA
CRA SUPERVISOR: K. LYNCH

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	SAMPLE NUMBER	STATE	'N' VALUE	PID (ppm)
	REFERENCE POINT (Top of Riser)	657.02				
	GROUND SURFACE	657.1				
	SM/ML–SAND and SILT(FILL), little vegetation, topsoil, loose, dark brown, moist	656.6				
1.0	ML–SILT(NATIVE), little sand and clay, stiff, red brown, moist		1SS		8	0
2.0						
3.0	– very stiff, mottled, gray, buff, brown and red brown , dry		2SS		29	0
4.0						
5.0	SM/ML–SAND and SILT, trace fine rounded gravel, dense, brown, dry	652.4	3SS		50	0
6.0						
7.0	GP–GRAVEL, some sand, shaly, dense, fine, dry	650.1	4SS		62	0
	SM/ML–SAND and SILT, trace fine rounded gravel, medium dense, brown, wet	649.8				
8.0	BEDROCK spoon refusal at 8.1 ft BGS, auger refusal at 8.4 ft BGS	649.0 648.7	5SS		>100	0
9.0	END OF OVERBURDEN HOLE @ 8.4 FT BGS					
10.0						
11.0						
12.0						
13.0						

NOTES:
1. At completion a 4" steel casing was installed to 8.4 ft. BGS for bedrock drilling.
2. Soil samples retained for geologic record.

MONITOR INSTALLATION



NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

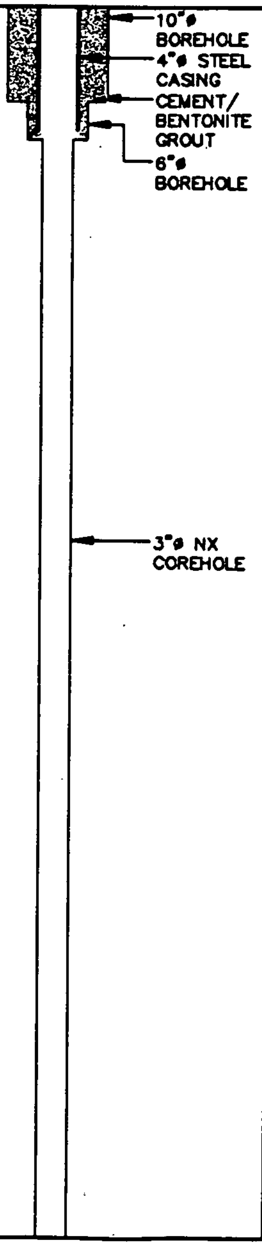
CHEMICAL ANALYSIS ○ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG (BEDROCK)

(L-67)

PROJECT NAME: LEICA INC. RI/FS
PROJECT NO.: 3967
CLIENT: LEICA INC.
LOCATION: CHEEKTOWAGA, NEW YORK

HOLE DESIGNATION: MW-2A (Page 2 of 3)
DATE COMPLETED: NOVEMBER 30, 1993
DRILLING METHOD: 8 1/4" ID HSA
CRA SUPERVISOR: K. LYNCH



DEPTH	DESCRIPTION OF STRATA	ELEVATION	MONITOR INSTALLATION	BEDROCK INTERVAL	RUN NUMBER	CORE RECOVERY	RQD	WATER RETURN
ft BGS		ft. AMSL				%	%	%
	Overburden							
8.0	LIMESTONE(Onondaga Formation, Moorehouse Member): light gray to dark gray, fine to medium grained, very thin to medium bedded, carbonaceous, trace coral, sparsley fossiliferous, little chert	649.0			WR			
9.0	– numerous moderately weathered fractures (9.0 to 10.1 ft BGS)							
10.0	– moderately weathered carbonaceous parting (⊕ 10.5 and 11.1 ft BGS)				1	100	67.0	80
11.0								
12.0	– very light gray, finer grained (11.9 to 14.3 and 15.9 to 18.0 ft BGS)							
13.0								
14.0								
15.0					2	96	44.0	60
16.0								
17.0	– moderately to heavily weathered interval (17.5 to 18.3 ft BGS)							
18.0					3	100	53.0	50
19.0								

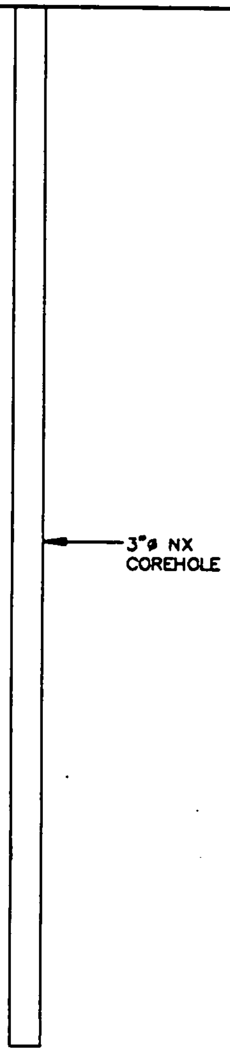
NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

▽ WATER FOUND ▼ STATIC WATER LEVEL NM – NOT MEASURED

STRATIGRAPHIC AND INSTRUMENTATION LOG
(BEDROCK)

PROJECT NAME:	LEICA INC. RI/FS	HOLE DESIGNATION:	MW-2A (Page 3 of 3)
PROJECT NO.:	3967	DATE COMPLETED:	NOVEMBER 30, 1993
CLIENT:	LEICA INC.	DRILLING METHOD:	8 1/4" ID HSA
LOCATION:	CHEEKTOWAGA, NEW YORK	CRA SUPERVISOR:	K. LYNCH

DEPTH ft BGS	DESCRIPTION OF STRATA	ELEVATION ft. AMSL	MONITOR INSTALLATION	BEDROCK INTERVAL	RUN NUMBER	CORE RECOVERY %	RQD %	WATER RETURN %
	– abundant carbonaceous partings (19.3 to 20.3 ft BGS)							
20.0	– light gray fine grained, weathered (20.2 to 22.3 ft BGS)							
21.0								
22.0	– detrital, coarser grained, infrequent small coral (22.3 to 26.0 ft BGS)				4	98	65.0	50
23.0								
24.0								
25.0								
26.0	– coral (26.7 to 26.9 ft BGS)							
27.0	– rugose coral (27.2 to 27.4 ft BGS)							
28.0	– brown gray chert nodule, fine grained, hard (27.9 to 28.5 ft BGS) – 1/2" thick shaly band (@ 28.6 ft BGS)				5	100	61.0	<50
29.0								
30.0	END OF HOLE @ 29.9 FT. BGS	627.1						
31.0								



NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

▽ WATER FOUND ▼ STATIC WATER LEVEL NM – NOT MEASURED

BOREHOLE LOG

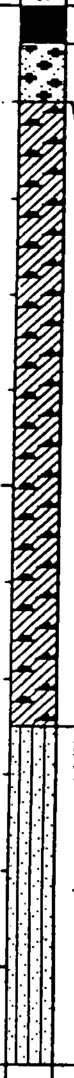
PROJECT: 90-821

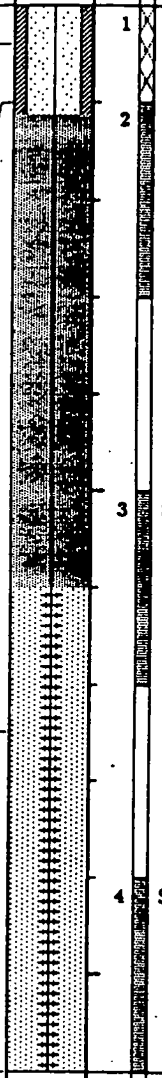
BOREHOLE: MW3

PHASE II SUBSOIL INVESTIGATION
CHEEKTOWAGA, NEW YORK
FOR: Leica Inc.

DATE: 22 November 1990
GEOLOGIST TEJ

STRATIGRAPHIC DESCRIPTION
REFERENCE POINT (Top of Riser) 655.94
GROUND SURFACE 656.20





DEPTH (ft)	STRATIGRAPHIC DESCRIPTION	SAMPLE						COMMENTS
		NUMBER	TYPE	N VALUE	% WATER	% REC	% RQD	
0.4	**ASPHALT**	1	GS					NO READINGS TAKEN
1.0	**SUB-BASE** Grey sand and gravel.	2	SS	10		50		
	SILTY CLAY TILL Brown silty clay, numerous fractures, trace fine sand, DTPL, stiff to very stiff. -Grey colored alteration observed along vertical fractures between about 1.0 and 3.0 ft.							
5		3	SS	20		0		NO RECOVERY DURING THIS INTERVAL
7.5	**SILTY SAND** Brown silty fine sand, trace fine gravel, moist, loose.							
9	-Saturated below about 9.0 ft.	4	SS	5		71		
11.0	Borehole terminated at 11.0 ft in silty sand. NOTE: ELEVATION RESURVEYED MARCH 1994.							AUGER REFUSAL AT 11.0 FT.

Gartner Lee Inc.

BOREHOLE LOG

PROJECT: 90-821

BOREHOLE: MW4

PHASE II SUBSOIL INVESTIGATION
CHEEKTOWAGA, NEW YORK
FOR: Leica Inc.

DATE: 20 November 1990
GEOLOGIST TEJ

STRATIGRAPHIC DESCRIPTION
REFERENCE POINT (Top of Riser) 655.57
GROUND SURFACE 656.00

DEPTH (ft)	STRATIGRAPHY	STRATIGRAPHIC DESCRIPTION	MONITOR DETAILS & NUMBER	SAMPLE NUMBER	SAMPLE INTERVAL	SAMPLE TYPE	N VALUE	% WATER	% REC	% RQD	COMMENTS
		FILL Dark brown to black silty clay, some sand and fine to medium gravel, firm. -Brick fragments and black colored staining observed.		1		GS					AUGERED DIRECTLY TO 1.0 FT.
1				2		SS	6		45		OVA rdg.= 2-4
3.0		**SILTY CLAY TILL** Red brown silty clay, trace fine sand and gravel, APL, very stiff.									
5				3		SS	16		83		OVA rdg.= 60 OVA rdg.= 400 IN AUGERS
8.0		**SILTY SAND**(inferred) Brown silty fine sand, trace fine gravel, saturated.									
9				4		SS	46		24		NO RECOVERY DUE TO CASING INSTALLATION
11.0		-Becoming a sand and gravel below about 11.0 ft.									
12.8		-Occasional limestone fragments observed at bottom of hole.		5		SS	50/ 1in.				
		Borehole terminated at 11.0 ft in sand and gravel. NOTE: Stratigraphy inferred from surrounding boreholes from about 7.0 to 11.0 ft. NOTE: ELEVATION RESURVEYED MARCH 1994.									AUGER REFUSAL AT 12.8 FT.

Gartner Lee Inc.

STRATIGRAPHIC AND INSTRUMENTATION LOG
(OVERBURDEN)

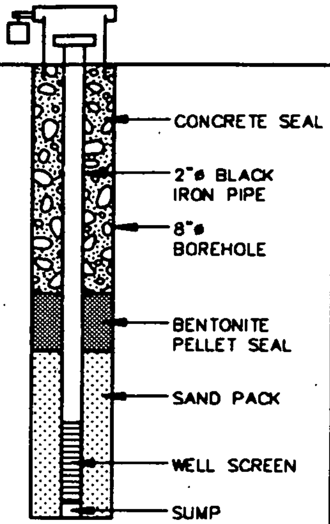
(L-01)

PROJECT NAME: LEICA
PROJECT NO.: 3967
CLIENT: LEICA
LOCATION: CHEEKTOWAGA, N.Y.

HOLE DESIGNATION: MW-5
DATE COMPLETED: JULY 1, 1991
DRILLING METHOD: 4 1/4" ID HSA
CRA SUPERVISOR: K. LYNCH

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL
	REFERENCE POINT (Top of Riser)	654.80
	GROUND SURFACE	655.24
	Augered through asphalt to 0.5 ft BGS	-0.5
	Gray fine to medium SAND, little fine to medium angular gravel, moist, FILL	
2.5	Same, except dry to moist	-2.9
	Red brown CLAY, some silt, little sand, trace fine round gravel, hard, dense, dry to moist; NATIVE	
5.0		
	Red brown SILT, some fine to medium sand, little clay, moist	-6.4
7.5	Interbedded silt, fine sand and clay lenses, (7.4 to 7.6 ft BGS)	-8.0 -8.4
	Red brown CLAY, little silt, soft, moist	-8.9
10.0	Gray CLAY, soft, moist	
	Gray fine to medium SAND, moist to wet	
	Same, with some silt	
12.5	Gray fine to coarse SAND, little fine round gravel, moist to wet	-11.9
	Same, except hard, dry	
	END OF HOLE @ 11.9 FT. BGS	
15.0	NOTES: 1. No soil samples taken for chemical analysis. Geologic record samples were collected.	
17.5	2. At completion a monitoring well was installed to 11.9 ft BGS.	
20.0		
22.5		
25.0		
27.5		
30.0		
32.5		

MONITOR INSTALLATION



SCREEN DETAILS:
Screened Interval:
9.4 to 11.5' BGS
Length -2.1'
Diameter -2.0"
Slot # 10
Material -Stainless Steel
Sand pack interval:
7.5 to 11.9' BGS
Material -# 4 Sand

SAMPLE

NUMBER	STATE	'N' VALUE	HNu (ppm)
1SS	☒	11	0.9
2SS	☒	14	1.2
3SS	☒	24	1.9
4SS	☒	15	2.8
5SS	☒	8	1.2
6SS	☒	12	1

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

GRAIN SIZE ANALYSIS ○ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG
(OVERBURDEN)

(L-68)

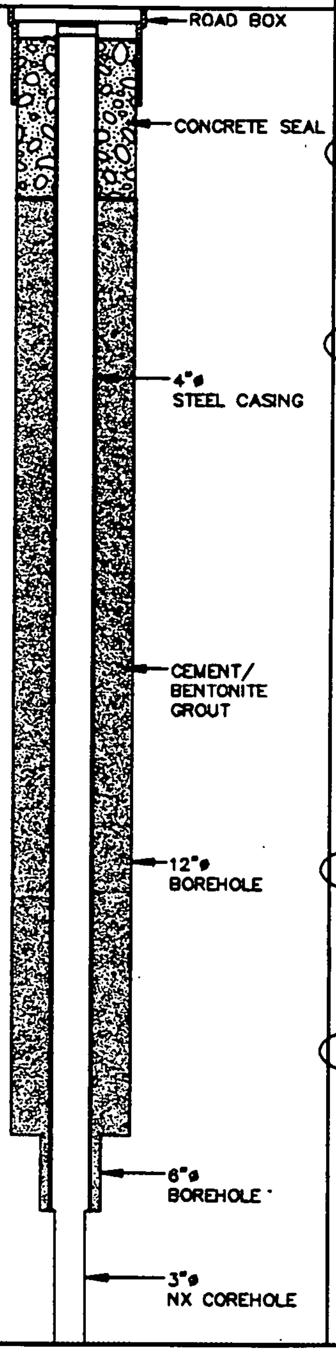
PROJECT NAME: LEICA INC. RI/FS
PROJECT NO.: 3967
CLIENT: LEICA INC.
LOCATION: CHEEKTOWAGA, NEW YORK

HOLE DESIGNATION: MW-5A (Page 1 of 4)
DATE COMPLETED: DECEMBER 1, 1993
DRILLING METHOD: 8 1/4" ID HSA
CRA SUPERVISOR: K. LYNCH

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE	SAMPLE PID (ppm)
	REFERENCE POINT (Top of Riser)	654.84				
	GROUND SURFACE	655.3				
	Asphalt pavement					
	GW-GRAVEL(FILL), fine to medium, angular, dry	654.8				
1.0	CL-CLAY, little sand and gravel, soft, brown to red brown, dry to moist	654.3	1SS	☒	14	10
2.0	SM/ML-SAND and SILT, little gravel, medium stiff, dry to moist	653.4				
3.0			3SS	☒	8	0.7
4.0						
	CL-CLAY(NATIVE), some silt, soft, red brown, moist Augered to 8.0 ft BGS	650.9				
5.0						
6.0						
7.0						
8.0	SM-SAND, some silt, trace fine rounded gravel, medium dense, moist to wet, no sheen or odor	647.3				
9.0			4SS	☒	25	18
10.0						
11.0			5SS	☒	34	7.5
	BEDROCK - wet rotary to 12.6 ft BGS	643.5				
12.0	END OF OVERBURDEN HOLE @ 12.6 FT BGS	642.7				
13.0						

NOTES:
1. At completion a 4" steel casing was installed for bedrock drilling to 12.6 ft BGS
2. Soil samples collected for chemical analysis from 1.0 to 4.5 ft BGS and 8.0 to 11.8 BGS for TCL VOCs, TAL Metals and TPH.
3. Soil samples retained for geologic record.
4. For statigraphy from 4.5 to 8.0 ft BGS see MW-5.

MONITOR INSTALLATION



NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

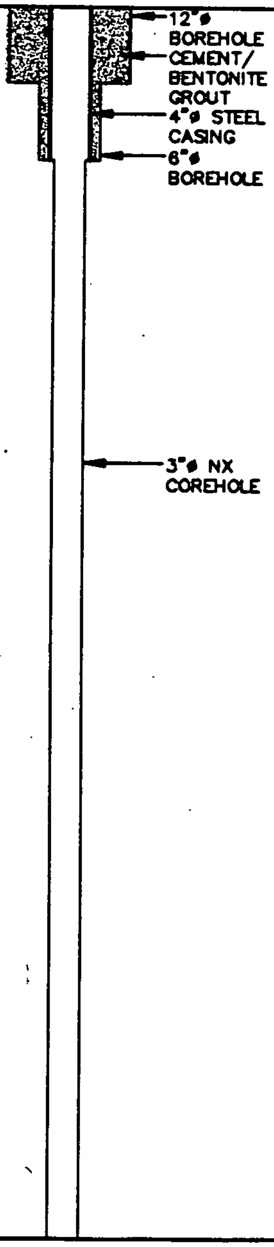
CHEMICAL ANALYSIS ○ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG (BEDROCK)

(L-69)

PROJECT NAME: LEICA INC. RI/FS
PROJECT NO.: 3967
CLIENT: LEICA INC.
LOCATION: CHEEKTOWAGA, NEW YORK

HOLE DESIGNATION: MW-5A (Page 2 of 4)
DATE COMPLETED: DECEMBER 1, 1993
DRILLING METHOD: 8 1/4" ID HSA
CRA SUPERVISOR: K. LYNCH

DEPTH	DESCRIPTION OF STRATA	ELEVATION	MONITOR INSTALLATION	BEDROCK	RUN NUMBER	CORE RECOVERY	RQD	WATER RETURN
ft BGS		ft. AMSL				%	%	%
	Overburden							
12.0	LIMESTONE(Onondaga Formation, Moorehouse Member): light gray to gray, thin to medium bedded, fine to medium grained, little coral and fossils, carbonaceous, little chert, stylolites, slightly to moderately weathered – rubble, heavily weathered (12.6 to 12.8 ft BGS) – small closed slightly weathered vertical 60° fracture (14.3 to 14.7 ft BGS) – brown to dark brown chert nodule (14.6 to 14.8 ft BGS) – slightly weathered break (@ 15.1 ft BGS) (17.5 to 18.3 ft BGS)	643.7						
13.0								
14.0								
15.0					1	91	52.0	90
16.0	– dark gray chert nodule (16.6 to 17.3 ft BGS)							
17.0	– light gray (17.3 to 19.3 ft BGS)							
18.0								
19.0	– dark gray, detrital layer, fossil fragments, little chert (19.3 to 20.0 ft BGS)				2	93	70.0	90
20.0	– brown chert (20.3 to 20.4 ft BGS)							
21.0								
22.0	– coral (20.6 to 20.7, 21.6 to 21.8, 22.2 to 22.3 ft BGS) – numerous slightly weathered fractures, occasional coral (22.0 to 25.8 ft BGS)				3	98	55.0	90
23.0								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

▽ WATER FOUND ▼ STATIC WATER LEVEL NM – NOT MEASURED

STRATIGRAPHIC AND INSTRUMENTATION LOG (BEDROCK)

(L-69)

PROJECT NAME: LEICA INC. RI/FS
PROJECT NO.: 3967
CLIENT: LEICA INC.
LOCATION: CHEEKTOWAGA, NEW YORK

HOLE DESIGNATION: MW-5A (Page 3 of 4)
DATE COMPLETED: DECEMBER 1, 1993
DRILLING METHOD: 8 1/4" ID HSA
CRA SUPERVISOR: K. LYNCH

DEPTH	DESCRIPTION OF STRATA	ELEVATION		INTERVAL	RUN NUMBER	CORE RECOVERY	RQD	WATER RETURN
ft BGS		ft. AMSL				%	%	%
24.0					3	98	55.0	90
25.0								
26.0	– buff to light brown chert (25.8 to 27.8 ft BGS)							
27.0								
28.0	– gray detrital layer, medium to coarse grained, numerous small coral and fossil fragments (27.8 to 29.9 ft BGS)		3"ø NX COREHOLE					
29.0					4	100	88.0	90
30.0	– dark gray chert (29.9 to 30.6, 30.8 to 32.1, 32.5 to 33.2, 33.3 to 33.4 and 33.5 to 34.0 ft BGS)							
31.0								
32.0								
33.0								
34.0					5	100	85.0	90
35.0	– buff to light brown chert (34.5 to 34.8, 35.0 to 35.2, 36.0 to 36.2, 37.1 to 37.2, 37.3 to 37.7, 38.4 to 38.6, 39.2 to 40.0 and 40.5 to 41.6 ft BGS)							

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

▽ WATER FOUND ▼ STATIC WATER LEVEL NM – NOT MEASURED

(L-69)

STRATIGRAPHIC AND INSTRUMENTATION LOG (BEDROCK)

PROJECT NAME: LEICA INC. RI/FS

PROJECT NO.: 3967

CLIENT: LEICA INC.

LOCATION: CHEEKTOWAGA, NEW YORK

HOLE DESIGNATION: MW-5A (Page 4 of 4)

DATE COMPLETED: DECEMBER 1, 1993

DRILLING METHOD: 8 1/4" ID HSA

CRA SUPERVISOR: K. LYNCH

DEPTH	DESCRIPTION OF STRATA	ELEVATION	MONITOR INSTALLATION	BEDROCK INTERVAL	RUN NUMBER	CORE RECOVERY	RQD	WATER RETURN
ft BGS		ft. AMSL				%	%	%
36.0								
37.0								
38.0					5	100	85.0	90
39.0			3"ø NX COREHOLE					
40.0								
41.0								
42.0	END OF HOLE @ 42 FT. BGS	612.8						
43.0								
44.0								
45.0								
46.0								
47.0								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

▽ WATER FOUND ▼ STATIC WATER LEVEL NM – NOT MEASURED

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(L-02)

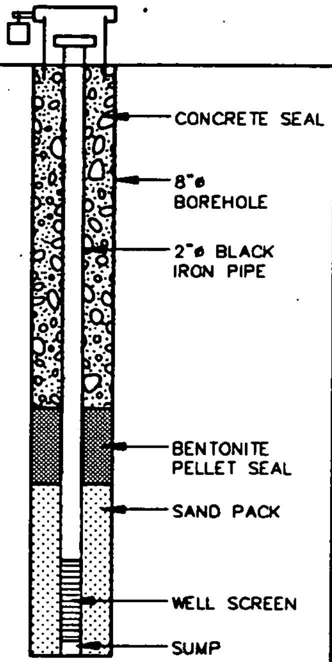
PROJECT NAME: LEICA
PROJECT NO.: 3967
CLIENT: LEICA
LOCATION: CHEEKTOWAGA, N.Y.

HOLE DESIGNATION: MW-6
DATE COMPLETED: JULY 1, 1991
DRILLING METHOD: 4 1/4" ID HSA
CRA SUPERVISOR: K. LYNCH

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL
	REFERENCE POINT (Top of Riser)	660.84
	GROUND SURFACE	661.16
	Dark brown fine SAND, some silt, trace coal, glass and vegetation, dry, FILL	
2.5	Same, except brown, little fine to medium concrete Black with white fine SAND, some fine coal, dry	-2.0
	Black SLAG, some coal and sand, moist	-4.5
5.0	Red brown SILT, little fine sand, some clay, dry, NATIVE	-4.8
7.5	Gray fine SAND, little silt, trace clay, dry to moist, some black discoloration Same, except moist	-6.8
10.0	Red brown CLAY, some silt, little fine sand and fine round gravel, dry, TILL Same, except little fine to medium rounded to subrounded gravel	-11.2
12.5	Red brown, gray and brown SILT, some fine sand, little clay, laminated, dry to moist Same, except gray and pink	-12.7
15.0	Gray fine SAND, little silt and clay, stiff, moist Gray fine to medium SAND, trace fine round gravel, soft, moist to wet	-15.5
	END OF HOLE @ 15.5 FT. BGS	
17.5		
20.0		
22.5		
25.0		
27.5		
30.0		
32.5		

NOTES:
1. No soil samples taken for chemical analysis. Geologic record samples were collected.
2. At completion a monitoring well was installed to 15.5 ft BGS.

MONITOR INSTALLATION



SCREEN DETAILS:
Screened Interval:
13.0 to 15.1' BGS
Length -2.1'
Diameter -2.0"
Slot # 10
Material -Stainless Steel
Sand pack interval:
11.0 to 15.5' BGS
Material -# 4 Sand

SAMPLE NUMBER	STATE	'N' VALUE	HNU (ppm)
1SS	☒	16	0.4
2SS	☒	4	0.8
3SS	☒	7	0.6
4SS	☒	11	0.8
5SS	☒	18	0.4
6SS	☒	18	0.4
7SS	☒	6	0.4
8SS	☒	>100	1.8

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

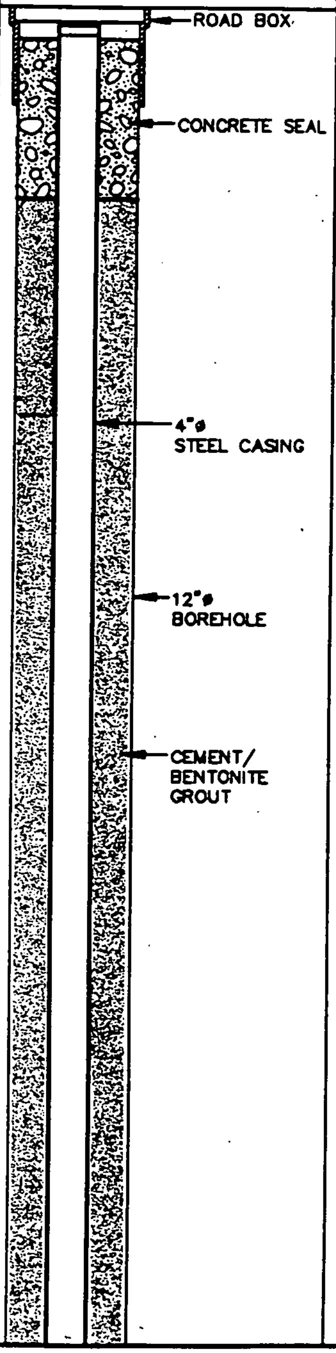
GRAIN SIZE ANALYSIS ○ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(L-70)

PROJECT NAME: LEICA INC. RI/FS
PROJECT NO.: 3967
CLIENT: LEICA
LOCATION: CHEEKTOWAGA, NEW YORK

HOLE DESIGNATION: MW-6A (Page 1 of 4)
DATE COMPLETED: DECEMBER 17, 1993
DRILLING METHOD: 8 1/4" ID HSA / WET ROTARY
CRA SUPERVISOR: K. LYNCH

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	MONITOR INSTALLATION	SAMPLE			
				NUMBER	STATE	'N' VALUE	PID (ppm)
	REFERENCE POINT (Top of Riser) GROUND SURFACE	*659.38* *659.8*					
	For overburden stratigraphy see MW-6						
1.0							
2.0							
3.0							
4.0							
5.0							
6.0							
7.0							
8.0							
9.0							
10.0							
11.0							
12.0							
13.0							

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

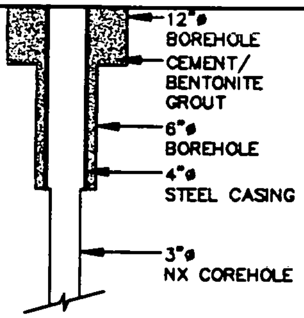
CHEMICAL ANALYSIS ◯ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG
(OVERBURDEN)

(L-70)

PROJECT NAME: LEICA INC. RI/FS
PROJECT NO.: 3967
CLIENT: LEICA INC.
LOCATION: CHEEKTOWAG, NEW YORK

HOLE DESIGNATION: MW-6A (Page 2 of 4)
DATE COMPLETED: DECEMBER 17, 1993
DRILLING METHOD: 8 1/4" ID HSA / WET ROTARY
CRA SUPERVISOR: K. LYNCH

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	MONITOR INSTALLATION	SAMPLE			
				NUMBER	STATE	'N' VALUE	PID (ppm)
14.0	BEDROCK – wet rotary to 14.9 ft BGS	646.2					
15.0	END OF OVERBURDEN HOLE @ 14.9 FT BGS NOTES: 1. At completion a 4" steel casing was installed for bedrock drilling to 14.9 ft BGS	644.9					
16.0							
17.0							
18.0							
19.0							
20.0							
21.0							
22.0							
23.0							
24.0							
25.0							
26.0							

<u>NOTES:</u> MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

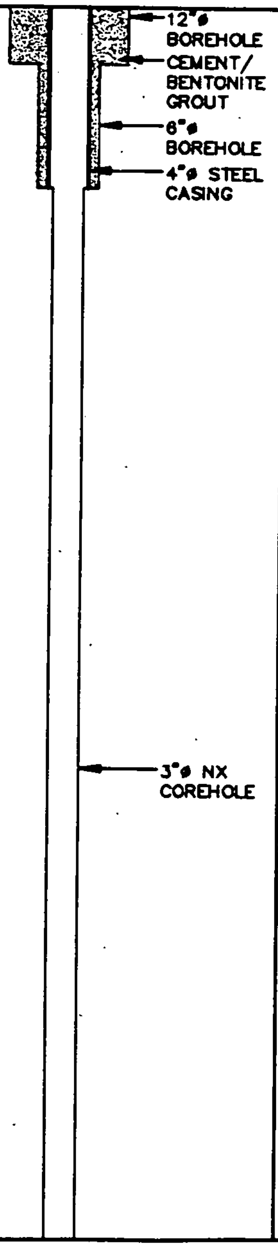
CHEMICAL ANALYSIS ○ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG (BEDROCK)

(L-71)

PROJECT NAME: LEICA INC. RI/FS
PROJECT NO.: 3967
CLIENT: LEICA INC.
LOCATION: CHEEKTOWAGA, NEW YORK

HOLE DESIGNATION: MW-6A (Page 3 of 4)
DATE COMPLETED: DECEMBER 17, 1993
DRILLING METHOD: 8 1/4" ID HSA
CRA SUPERVISOR: K. LYNCH

DEPTH	DESCRIPTION OF STRATA	ELEVATION	MONITOR INSTALLATION	BEDROCK INTERVAL	RUN NUMBER	CORE RECOVERY	RQD	WATER RETURN
ft BGS		ft. AMSL				%	%	%
	Overburden							
14.0	LIMESTONE(Onondaga Formation, Moorehouse Member): light gray, fine to medium grained, thinly bedded, carbonaceous, little chert, ocassional fossils and coral, numerous stylolites	646.2						
15.0								
16.0	– slightly weathered carbonaceous parting (@ 15.9 and 16.0 FT BGS)							
17.0								
18.0	– slighlty weathered 80° vertical fracture (18.3 to 18.7 ft BGS)							
19.0	– small coral (@ 18.9 and 19.0 ft BGS)							
20.0					1	98	64.0	60
	– numerous slightly weathered carbonaceous partings (@ 20.2 to 20.6 ft BGS) – moderately weathered carbonaceous partings (@ 20.6, 20.9, 22.0, 22.4, 23.6 and 24.9 ft BGS)							
21.0								
22.0								
23.0								
24.0								
25.0	– brachiopod fragments, coral fragments, moderately weathered break (@ 24.5 ft BGS) – rugose coral outline (@ 25.0 ft BGS) – brachiopod (@ 25.2 ft BGS)				2	100	88.0	0

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

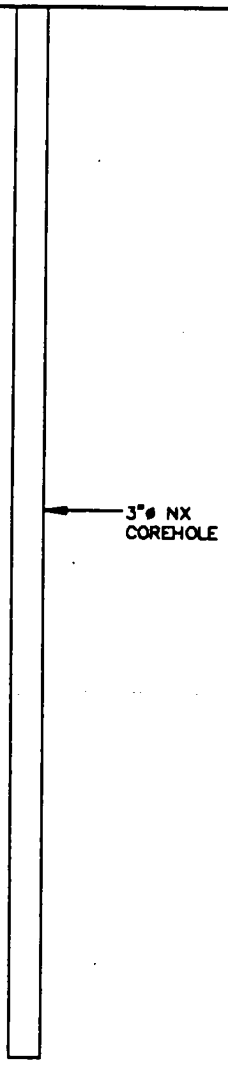
▽ WATER FOUND ▼ STATIC WATER LEVEL NM – NOT MEASURED

STRATIGRAPHIC AND INSTRUMENTATION LOG
(BEDROCK)

(L-71)

PROJECT NAME: LEICA INC. RI/FS
PROJECT NO.: 3967
CLIENT: LEICA INC.
LOCATION: CHEEKTOWAGA, NEW YORK

HOLE DESIGNATION: MW-6A (Page 4 of 4)
DATE COMPLETED: DECEMBER 17, 1993
DRILLING METHOD: 8 1/4" ID HSA
CRA SUPERVISOR: K. LYNCH

DEPTH	DESCRIPTION OF STRATA	ELEVATION	MONITOR INSTALLATION	BEDROCK INTERVAL	RUN NUMBER	CORE RECOVERY	RQD	WATER RETURN
ft BGS		ft. AMSL				%	%	%
	- brachiopod and coral fragments, coarser grained matrix (@ 25.7 ft BGS)		 3"Ø NX COREHOLE					
26.0	- slightly to moderately weathered carbonaceous parting (@ 25.9, 26.6 and 29.9 ft BGS)							
27.0	- coral, slight petroleum oil odor, fossil fragments in matrix (25.9 to 26.1 ft BGS) - several small rugose coral outlines (27.0 to 27.2 ft BGS)							
28.0	- medium to dark gray mottled, some limestone remineralization (27.4 to 27.9 ft BGS) - brachiopod fossil (@ 27.8 ft BGS)				2	100	88.0	0
29.0	- small gypsum mass and gypsum filled veinlets (@ 29.3 ft BGS)							
30.0	- coral, coral fragments, detrital layer, coarser grained (30.0 to 30.1, 30.3 to 32.1, 34.2 to 34.4 ft BGS) - finer grained (30.1 to 30.3 ft BGS)							
31.0								
32.0	- brown gray chert nodules, slight HCl reaction, fine grained, hard (32.1 to 32.8, 33.5 to 34.0, 34.1 to 34.2 and 34.4 to 36.0 ft BGS)							
33.0	- small coral, open veins (32.8 to 32.9 ft BGS)							
34.0					3	100	100.0	0
35.0								
36.0	END OF HOLE @ 36.0 FT. BGS	623.8						
37.0								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

▽ WATER FOUND ▼ STATIC WATER LEVEL NM - NOT MEASURED

STRATIGRAPHIC AND INSTRUMENTATION LOG
(OVERBURDEN)

(L-03)

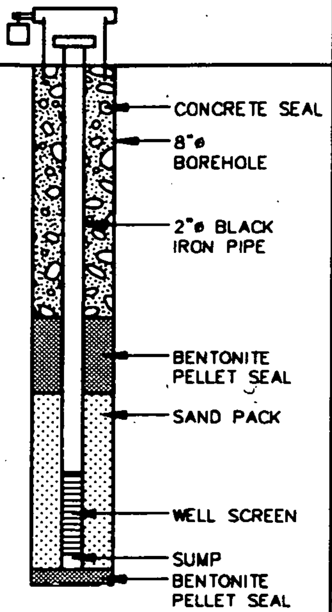
PROJECT NAME: LEICA
PROJECT NO.: 3967
CLIENT: LEICA
LOCATION: CHEEKTOWAGA, N.Y.

HOLE DESIGNATION: MW-7
DATE COMPLETED: JULY 2, 1991
DRILLING METHOD: 4 1/4" ID HSA
CRA SUPERVISOR: K. LYNCH

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL
	REFERENCE POINT (Top of Riser)	658.21
	GROUND SURFACE	658.51
	Augered through asphalt to 0.5 ft BGS	-0.5
	Gray medium SAND, some medium gravel and asphalt, dry to moist, FILL	-1.1 -1.4
2.5	Black fine COAL, some silt and sand, moist, some brown discoloration	
	Red brown CLAY, little silt and fine sand, trace gravel, moist, some black discoloration, fuel oil and gasoline odor	-3.8
5.0	Same, with trace wood, gasoline odor	-5.1
	Black SILT, some clay, little fine sand, moist gasoline and septic odor	
7.5	Same, except grading to gray	
	Red brown CLAY, some silt, moist, NATIVE	-8.6
10.0	Same, except little silt, hard, dense, dry to moist	
	Red brown and gray SILT and CLAY, some sand, laminated	-10.6
12.5	Gray medium SAND, trace fine to medium gravel, moist to wet	-13.0
	Brown to red brown SILT, some clay, little fine to medium sand, hard, dense, dry to moist	-13.6
15.0	END OF HOLE @ 13.6 FT. BGS	
17.5		
20.0		
22.5		
25.0		
27.5		
30.0		
32.5		

NOTES:
1. No soil samples taken for chemical analysis. Geologic record samples were collected.
2. At completion a monitoring well was installed to 13.2 ft BGS.

MONITOR INSTALLATION



SCREEN DETAILS:
Screened Interval:
10.7 to 12.8' BGS
Length -2.1'
Diameter -2.0"
Slot # 10
Material -Stainless Steel
Sand pack interval:
8.6 to 13.2' BGS
Material -# 4 Sand

SAMPLE NUMBER	STATE	'N' VALUE	HNu (ppm)
1SS	☒	14	2.2
2SS	☒	5	55
3SS	☒	14	35
4SS	☒	30	55
5SS	☒	27	10-12
6SS	☒	26	7.5
7SS	☒	>50	1.5

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

GRAIN SIZE ANALYSIS ⬭ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG
(OVERBURDEN)

(L-05)

PROJECT NAME: LEICA
PROJECT NO.: 3967
CLIENT: LEICA
LOCATION: CHEEKTOWAGA

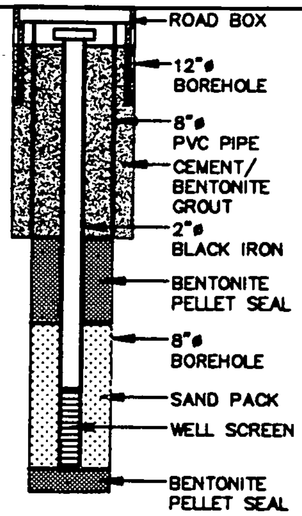
HOLE DESIGNATION: BH-A / MW-8
DATE COMPLETED: JANUARY 22, 1992
DRILLING METHOD: 8 1/4" ID HSA / 4 1/4" ID HSA
CRA SUPERVISOR: K. LYNCH

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE	SAMPLE PID (ppm)
	REFERENCE POINT (Top of Riser)	656.11				
	GROUND SURFACE	656.43				
	Black and brown ASPHALT, some gravel, dry, FILL	-0.5	1SS	☒	23	3.6
2.5	Dark gray CINDERS, some brick, clay and gravel, moist, fuel oil odor	-2.0				
	Dark gray CLAY, some coal, some white fibrous waste, red discoloration, moist, fuel oil / petroleum odor	-3.2	2SS	☒	15	32.9
5.0	Gray SAND, some silt and clay, moist Same, except dry to moist	-4.8 -6.0	3SS	☒	22	4.2 23.3
7.5	Red brown SILT, some sand, little clay, dry to moist, sour odor, NATIVE	-7.0	4SS	☒	13	24 32
	Red brown CLAY, little silt and fine round gravel, dry to moist, sour odor	-7.8				
10.0	Gray and brown SILT, some clay, little interbedded sand lenses, moist, sour odor	-9.2	5SS	☒	9	39 51
	Gray CLAY, some silt, dry to moist, sour odor		6SS	☒	39	54 38
12.5	Gray SAND, little silt and clay, moist Same, except fine to medium grained, trace to little fine round gravel, moist to wet, sour odor Same, with clay lens, some sheen NAPL (@ 11.5 to 11.8 ft BGS)	-11.5 -12.6	7SS	☒	>50	44
15.0	Gray fine SAND, some fine gravel, hard, dense, dry to moist, petroleum odor					
17.5	END OF HOLE @ 12.6 FT. BGS					
20.0						
22.5						
25.0						
27.5						
30.0						
32.5						

NOTES:

1. At completion a monitoring well was installed to 11.9 ft BGS.
2. Soil samples were collected for chemical analysis from 11.5 to 12.0 ft BGS for VOCs and TPH.

MONITOR INSTALLATION



SCREEN DETAILS:
Screened Interval:
9.9 to 11.9' BGS
Length -2.0'
Diameter -2.0"
Slot # 10
Material -Stainless Steel
Sand pack interval:
8.2 to 12.0' BGS
Material -# 2 QROC

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS ○ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG
(OVERBURDEN)

(L-06)

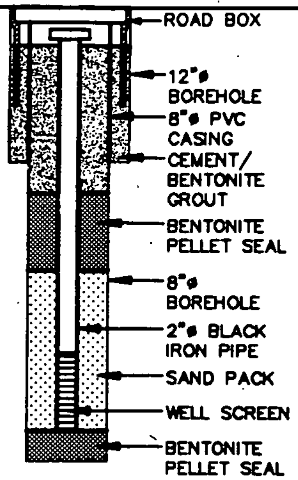
PROJECT NAME: LEICA
PROJECT NO.: 3967
CLIENT: LEICA
LOCATION: CHEEKTOWAGA

HOLE DESIGNATION: BH-B / MW-9
DATE COMPLETED: JANUARY 22, 1992
DRILLING METHOD: 8 1/4" ID HSA / 4 1/4" ID HSA
CRA SUPERVISOR: K. LYNCH

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL
	REFERENCE POINT (Top of Riser)	654.99
	GROUND SURFACE	655.36
	Black and gray ASPHALT, some gravel, dry to moist, FILL	-0.5
2.5	Red brown SAND, some silt, little gravel, dry to moist	-1.7 -2.8
	Dark brown and gray CLAY, some gravel, moist to wet, slight petroleum odor	-3.1 -4.0
5.0	Red brown and gray CLAY, some silt, little sand, dry to moist, NATIVE	-5.0
7.5	Red brown and gray SAND, some silt, little fine gravel, trace clay, dry to moist, dense, slight sour odor	-7.3
	Red brown SILT, some clay, little sand and fine gravel, dry to moist, no odor	-8.3
10.0	Red brown CLAY, some silt, trace fine to medium gravel and sand, dry to moist, no odor	-9.4
	Same, except little sand in lenses	-11.1
	Same, except gray, little silt and fine sand	-11.8
12.5	Gray SAND, little silt and clay, moist, no odor	
	Same, with trace fine rounded gravel, moist to wet	
15.0	Gray CLAY, little sand seams (1/8" or less), trace fine rounded gravel, moist, no odor	
	Gray fine to medium SAND, trace silt and clay, moist to wet, no odor	
17.5	Gray fine SAND, some silt, trace gravel, dense, dry to moist, no odor	
20.0	END OF HOLE @ 11.8 FT. BGS	
22.5		
25.0		
27.5		
30.0		
32.5		

NOTES:
1. At completion a monitoring well was installed to 11.0 ft BGS.

MONITOR INSTALLATION



SCREEN DETAILS:
Screened Interval:
9.0 to 11.0' BGS
Length –2.0'
Diameter –2.0"
Slot # 10
Material –Stainless Steel
Sand pack interval:
6.8 to 11.0' BGS
Material –#2 QROC

SAMPLE

NUMBER	STATE	'N' VALUE	PID (ppm)
1SS	☒	11	0
2SS	☒	18	0
3SS	☒	19	2.2 2.0
4SS	☒	14	2.4 2.8
5SS	☒	5	2.2 2.6
6SS	☒	58	2.7 2.7

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS ○ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG
(OVERBURDEN)

(L-07)

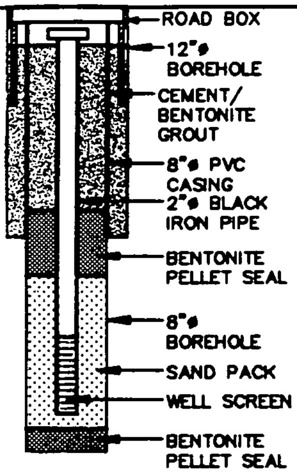
PROJECT NAME: LEICA
PROJECT NO.: 3967
CLIENT: LEICA
LOCATION: CHEEKTOWAGA

HOLE DESIGNATION: BH-C / MW-10
DATE COMPLETED: JANUARY 22, 1992
DRILLING METHOD: 8 1/4" ID HSA / 4 1/4" ID HSA
CRA SUPERVISOR: K. LYNCH

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE	SAMPLE PID (ppm)
	REFERENCE POINT (Top of Riser)	655.48				
	GROUND SURFACE	655.82				
	Dark brown and red brown SILT, some clay and sand, trace coal, brick, slag, concrete and plastic, dry to moist, no odor, FILL		1SS	☒	6	0
2.5	Red brown SILT, some clay, little sand and gravel, dry to moist	-3.0	2SS	☒	7	4 19.3
	Black and dark gray SILT, some sand and organic matter, moist, NATIVE	-3.8 -4.3				
5.0	Black and dark gray fine to medium SAND, little silt, moist, gasoline odor	-6.0	3SS	☒	24	23 9.2
	Red brown SILT, some clay and sand, dry to moist		4SS	☒	15	46 79.2
7.5	Red brown CLAY, some silt, little sand, trace gravel, dry to moist, slight odor	-8.7				
	Same, except little sand in interbedded lenses, some odor		5SS	☒	12	23.9 14.9
10.0	Same, with some gravel, musty odor	-10.5				
	Gray SAND, little silt and clay, trace round gravel, moist	-11.6	6SS	☒	69	39.7 14
12.5	Same, except medium grained, poorly graded, wet					
	Gray fine SAND, some fine gravel, hard, dense dry to moist					
15.0	END OF HOLE @ 11.6 FT. BGS					
17.5						
20.0						
22.5						
25.0						
27.5						
30.0						
32.5						

NOTES:
1. At completion a monitoring well was installed to 11.9 ft BGS.
2. Soil sample submitted for chemical analysis for TPH from 3.8 to 4.1 ft BGS.

MONITOR INSTALLATION



SCREEN DETAILS:
Screened Interval:
8.6 to 10.6' BGS
Length -2.0'
Dia'eter -2.0"
Slot # 10
Material -Stainless Steel
Sand pack interval:
7.0 to 11.0' BGS
Material -#2 QROC

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS ○ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG
(OVERBURDEN)

(L-08)

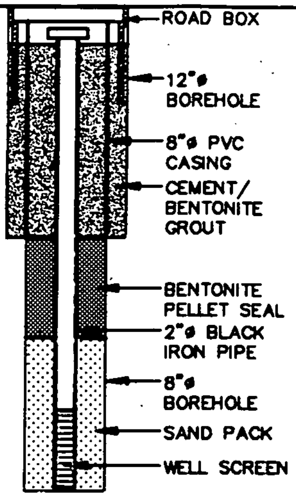
PROJECT NAME: LEICA
PROJECT NO.: 3967
CLIENT: LEICA
LOCATION: CHEEKTOWAGA

HOLE DESIGNATION: BH-D / MW-11
DATE COMPLETED: JANUARY 23, 1992
DRILLING METHOD: 8 1/4" ID HSA / 4 1/4" ID HSA
CRA SUPERVISOR: K. LYNCH

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL
	REFERENCE POINT (Top of Riser)	656.08
	GROUND SURFACE	656.58
	Black and gray ASPHALT, some sand and gravel, dry to moist, FILL	-0.5
2.5	Red brown SAND, some silt, little clay, trace gravel, dry	
	Dark brown and red brown CLAY, dry to moist	-3.0
5.0	Gray fine to medium SAND, little silt, moist, slight odor, NATIVE	-3.8 -4.3
	Red brown SILT, some clay, little sand and gravel, dry to moist, sour odor	-6.0
7.5	Red brown CLAY, some silt, little sand, trace gravel, dry to moist, slight sour odor Same, except gray, some sand in alternating layers	
10.0	Gray SAND, little silt and clay, well graded, moist, slight petroleum odor	-9.8
	Same, with some fine to medium gravel, little silt, no clay	-11.2
12.5	Gray fine SAND, trace fine gravel, dense, moist, gravel content increases with depth, slight odor	-12.6
15.0	END OF HOLE @ 12.6 FT. BGS	
17.5		
20.0		
22.5		
25.0		
27.5		
30.0		
32.5		

NOTES:
1. At completion a monitoring well was installed to 12.5 ft BGS.
2. Soil samples were collected for chemical analysis from 4.0 to 6.0 ft and from 10.8 to 11.4 ft BGS for VOCs and TPH. A sample containing a dark brown NAPL mixed into the soil was collected for chemical analysis from the auger plug after augering from 12.0 to 12.5 ft BGS.

MONITOR INSTALLATION



SCREEN DETAILS:
Screened Interval:
10.5 to 12.5' BGS
Length -2.0'
Dia'eter -2.0"
Slot # 10
Material -Stainless Steel
Sand pack interval:
8.6 to 12.6' BGS
Material -#2 QROC

SAMPLE			
NUMBER	STATE	'N' VALUE	PID (ppm)
1SS	☒	24	0
2SS	☒	7	0
3SS	☒	21	14 20
4SS	☒	32	46.1
5SS	☒	11	100 42.6
6SS	☒	14	260 293
7SS	☒	>50	169

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS ◯ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG
(OVERBURDEN)

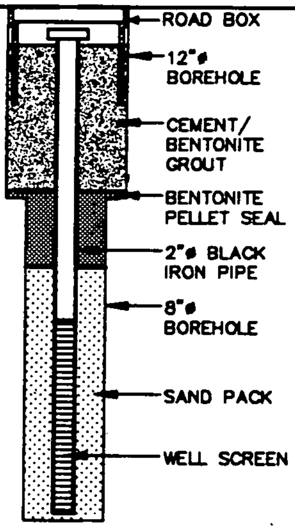
(L-09)

PROJECT NAME: LEICA
PROJECT NO.: 3967
CLIENT: LEICA
LOCATION: CHEEKTOWAGA

HOLE DESIGNATION: MW-12
DATE COMPLETED: JANUARY 29, 1992
DRILLING METHOD: 8 1/4" ID HSA / 4 1/4" ID HSA
CRA SUPERVISOR: K. LYNCH

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE	SAMPLE HNU (ppm)
	REFERENCE POINT (Top of Riser)	656.93				
	GROUND SURFACE	657.30				
	Augered to 6.0 ft BGS					
2.5						
5.0						
	Red brown SILT, some clay, little sand and fine gravel, dry to moist, no odor, NATIVE	-6.0				
7.5			1SS	☒	34	0
	Brown and gray with red brown CLAY, some silt and interbedded sand lenses, dry to moist, no odor	-8.9	2SS	☒	18	0
10.0	Same, except little sand	-10.2	3SS	☒	11	0
12.5	Gray SAND, some silt, little fine gravel, moist to wet, slight petroleum odor		4SS	☒	>50	42 0
	END OF HOLE @ 13.4 FT. BGS	-13.4				
15.0	NOTES: 1. At completion a monitoring well was installed to 13.2 ft BGS. 2. Soil samples were collected for chemical analysis from 10.0 to 12.0 ft BGS for VOCs and TPH.					
17.5						
20.0						
22.5						
25.0						
27.5						
30.0						
32.5						

MONITOR INSTALLATION



SCREEN DETAILS:
Screened Interval:
8.2 to 13.2' BGS
Length -5.0'
Diameter -2.0"
Slot # 10
Material -Stainless Steel
Sand pack interval:
6.8 to 13.4' BGS
Material -#2 QROC

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS ○ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG
(OVERBURDEN)

(L-72)

PROJECT NAME: LEICA INC. RI/FS
PROJECT NO.: 3967
CLIENT: LEICA INC.
LOCATION: CHEEKTOWAGA, NEW YORK

HOLE DESIGNATION: MW-13
DATE COMPLETED: DECEMBER 8, 1993
DRILLING METHOD: 4 1/4" ID HSA
CRA SUPERVISOR: K. LYNCH

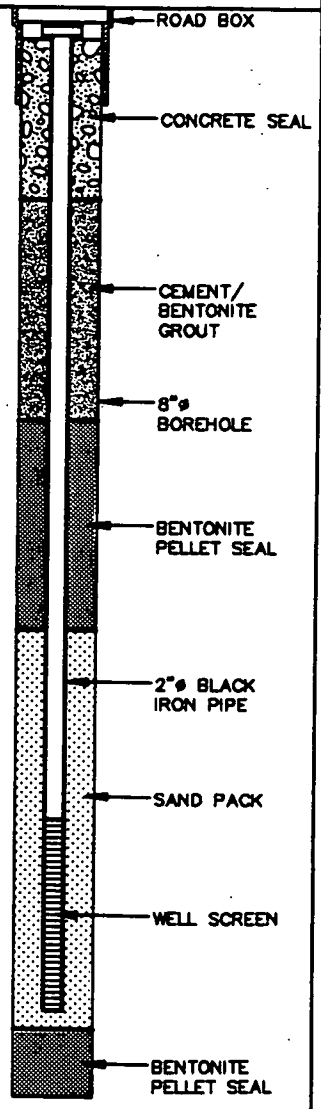
DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE	SAMPLE PID (ppm)
	REFERENCE POINT (Top of Riser) GROUND SURFACE	654.66 654.9				
	ML-SILT(FILL), some clay, little sand, dark brown, moist, no odor, no sheen					
1.0			1SS		4	2
	ML-SILT(NATIVE), some clay, little sand, trace gravel and rootlets, stiff to very stiff, laminated, red brown, dry to moist	653.5				
2.0						
3.0			2SS		14	4
4.0						
5.0			3SS		22	0.6
6.0						
7.0	SM-SAND, little silt, trace fine round gravel, trace intermittant clay, fine to medium grained, gray with brown, moist to wet	648.1	4SS		24	1
8.0						
9.0			5SS		25	0
10.0						
			6SS		>60	0
11.0	SP-SAND(TILL), little to some subrounded gravel, trace silt, dense, fine grained, gray, moist	643.9 643.5				
12.0						
13.0						

END OF HOLE @ 11.4 FT. BGS

NOTES:

1. At completion a 2" monitoring well was installed to 10.5 ft BGS.
2. Soil samples collected for chemical analysis from 2.0 to 4.0 ft BGS and 8.0 to 11.0 ft BGS for TCL VOCs, TAL Metals and TPH.
3. Shelby tube sample collected from adjacent borehole from 3.5 to 5.5 ft BGS for grain size, permeability, porosity, atterberg limits

MONITOR INSTALLATION



SCREEN DETAILS:
Screened Interval:
8.5 to 10.5' BGS
Length -2.0'
Diameter -2.0"
Slot # 10
Material -Stainless Steel

Sand pack interval:
6.5 to 10.7' BGS
Material -# 0 Morey

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

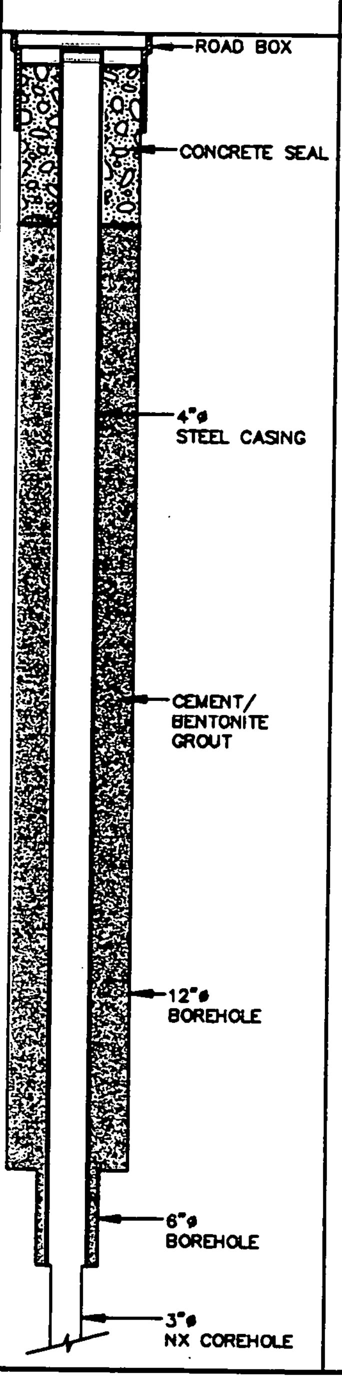
CHEMICAL ANALYSIS ○ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG
(OVERBURDEN)

(L-73)

PROJECT NAME: LEICA INC. RI/FS
PROJECT NO.: 3967
CLIENT: LEICA INC.
LOCATION: CHEEKTOWAGA, NEW YORK

HOLE DESIGNATION: MW-13A (Page 1 of 4)
DATE COMPLETED: DECEMBER 9, 1993
DRILLING METHOD: 8 1/4" ID HSA
CRA SUPERVISOR: K. LYNCH

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE	SAMPLE PID (ppm)
	REFERENCE POINT (Top of Riser) GROUND SURFACE	655.13 655.4					
	For overburden stratigraphy see MW-13						
1.0							
2.0							
3.0							
4.0							
5.0							
6.0							
7.0							
8.0							
9.0							
10.0							
11.0							
12.0	BEDROCK – wet rotary to 12.9 ft BGS	643.5					
13.0	END OF OVERBURDEN HOLE @ 12.9 FT BGS	642.5					

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

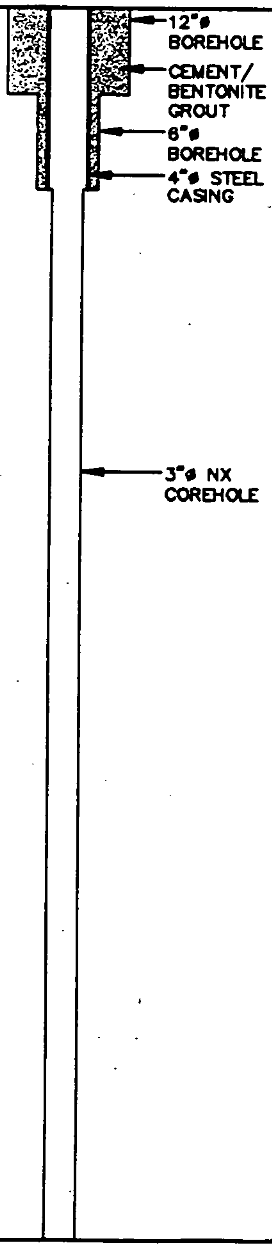
CHEMICAL ANALYSIS ○ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG
(BEDROCK)

(L-74)

PROJECT NAME: LEICA INC. RI/FS
PROJECT NO.: 3967
CLIENT: LEICA INC.
LOCATION: CHEEKTOWAGA, NEW YORK

HOLE DESIGNATION: MW-13A (Page 2 of 4)
DATE COMPLETED: DECEMBER 9, 1993
DRILLING METHOD: 8 1/4" ID HSA / WET ROTARY
CRA SUPERVISOR: K. LYNCH

DEPTH ft BGS	DESCRIPTION OF STRATA	ELEVATION ft. AMSL	MONITOR	BEDROCK INTERVAL	RUN NUMBER	CORE RECOVERY %	RQD %	WATER RETURN %
	Overburden							
12.0	LIMESTONE(Onondaga Formation, Moorehouse Member): light gray, fine grained, slightly to moderately weathered, trace vertical fractures, massively bedded, trace coral, some chert, stylolites, some carbonaceous partings	643.5			WR			
13.0	– heavily weathered rubble (12.9 to 13.3 ft BGS)							
14.0	– moderately weathered break (@ 13.7 ft BGS) – slightly weathered vertical break (14.0 to 14.3 ft BGS)				1	95	19.0	90
15.0	– moderately weathered break (@ 14.5, 14.7 and 16.4 ft BGS)							
16.0								
17.0	– 40° inclined moderately weathered break (@ 17.5 ft BGS) – stylolite (@ 17.7 ft BGS)							
18.0	– small coral (@ 18.6 ft BGS)							
19.0	– stylolite break, slightly weathered (@ 19.1 ft BGS) – abundant small coral, pitting due to coral erosion (19.1 to 20.0 ft BGS)							
20.0	– coral (20.0 to 20.2 and 20.3 to 20.5 ft BGS) – massive coral, open veined, brown stained, fuel oil odor (20.6 to 21.1 ft BGS)				2	99	98.0	80
21.0	– black carbon depoits in openings of coral, 1/4" layer (@ 21.1 ft BGS) – abundant small coral (21.1 to 21.7 ft BGS)							
22.0	– no staining (below 21.7 ft BGS) – abundant small coral, mostly small rugose and fan (@ 21.7 to 45.0 ft BGS)							
23.0								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

▽ WATER FOUND ▼ STATIC WATER LEVEL NM – NOT MEASURED

STRATIGRAPHIC AND INSTRUMENTATION LOG (BEDROCK)

(L-74)

PROJECT NAME: LEICA INC. RI/FS
PROJECT NO.: 3967
CLIENT: LEICA INC.
LOCATION: CHEEKTOWAGA, NEW YORK

HOLE DESIGNATION: MW-13A (Page 3 of 4)
DATE COMPLETED: DECEMBER 9, 1993
DRILLING METHOD: 8 1/4" ID HSA / WET ROTARY
CRA SUPERVISOR: K. LYNCH

DEPTH	DESCRIPTION OF STRATA	ELEVATION	MONITOR	BEDROCK INTERVAL	RUN NUMBER	CORE RECOVERY	RQD	WATER RETURN
ft BGS		ft. AMSL				%	%	%
	– fans coral (23.7 to 23.9 ft BGS)							
24.0					2	99	98.0	80
25.0	– large rugose coral (25.1 to 25.2 ft BGS)							
26.0								
	– moderately weathered break (@ 26.4 ft BGS)							
27.0								
	– open veined fan coral (27.6 to 27.8 ft BGS)							
28.0	– small brachiopod fossils (@ 27.9 ft BGS) – coral (28.3 to 28.4 ft BGS)		3"φ NX COREHOLE					
29.0	– rugose coral (29.2 to 29.3 ft BGS)							
30.0					3	100	100.0	70
31.0								
	– moderately weathered coral zone, abundant coral (31.6 to 33.2 ft BGS)							
32.0								
33.0								
	– stylolytic zone, finer grained, no coral (33.5 to 33.8 ft BGS)							
34.0	– massive coral zone, heavily weathered, yellow brown color, slight odor (34.2 to 34.6 ft BGS)							
35.0	– weathered break (@ 35.0, 35.8 and 37.0 ft BGS)							
					4	100	100.0	80

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

▽ WATER FOUND ▼ STATIC WATER LEVEL NM – NOT MEASURED

(L-74)

STRATIGRAPHIC AND INSTRUMENTATION LOG
(BEDROCK)

PROJECT NAME: LEICA INC. RI/FS
PROJECT NO.: 3967
CLIENT: LEICA INC.
LOCATION: CHEEKTOWAGA, NEW YORK

HOLE DESIGNATION: MW-13A (Page 4 of 4)
DATE COMPLETED: DECEMBER 9, 1993
DRILLING METHOD: 8 1/4" ID HSA / WET ROTARY
CRA SUPERVISOR: K. LYNCH

DEPTH	DESCRIPTION OF STRATA	ELEVATION	MONITOR	BEDROCK INTERVAL	RUN NUMBER	CORE RECOVERY	RQD	WATER RETURN
ft BGS		ft. AMSL				%	%	%
	– lighter gray, abundant small coral (35.3 to 37.9 ft BGS)							
36.0								
37.0								
38.0	– darker gray, coarser grained, slight odor (38.0 to 40.6 ft BGS)							
39.0	– large rugose coral (@ 39.0 to 39.2 ft BGS)							
40.0			3"ø NX COREHOLE		4	100	100.0	80
	– lighter gray, less coral, no staining, finer grained stylolites (40.6 to 44.5 ft BGS)							
41.0								
42.0								
43.0								
44.0								
	– large stylolites (44.5 ft BGS) – abundant fan coral, darker gray matrix, brown staining, slight odor (44.5 to 45.0 ft BGS)							
45.0	END OF HOLE @ 45.0 FT. BGS	610.4						
46.0								
47.0								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

▽ WATER FOUND ▼ STATIC WATER LEVEL NM – NOT MEASURED

STRATIGRAPHIC AND INSTRUMENTATION LOG
(OVERBURDEN)

(L-75)

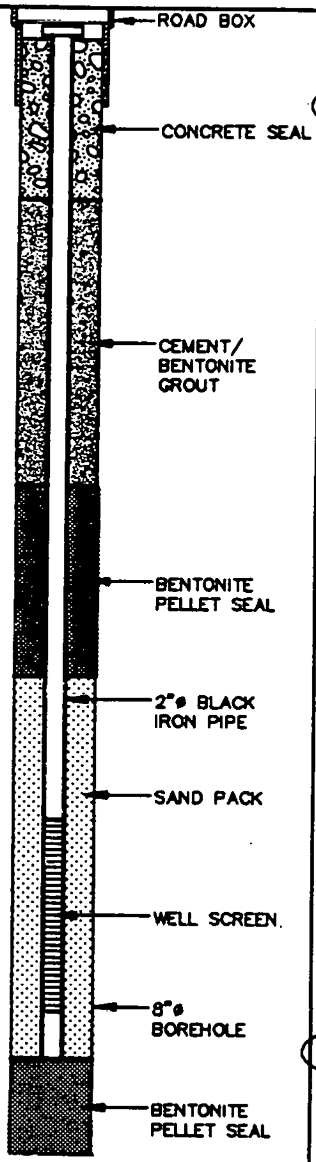
PROJECT NAME: LEICA INC. RI/FS
PROJECT NO.: 3967
CLIENT: LEICA INC.
LOCATION: CHEEKTOWAGA, NEW YORK

HOLE DESIGNATION: MW-14
DATE COMPLETED: DECEMBER 6, 1993
DRILLING METHOD: 4 1/4" ID HSA
CRA SUPERVISOR: K. LYNCH

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL
	REFERENCE POINT (Top of Riser)	653.38
	GROUND SURFACE	653.7
	ML-SILT(FILL), some clay, little sand, trace vegetation, medium stiff, red brown, dry to moist	
1.0	ML-SILT(NATIVE), little sand, trace clay, roots, loose, loamy, dark brown, moist	652.7
2.0	— some sand, little clay, soft, red brown, moist	
3.0		
4.0	CL-CLAY, little silt, trace fine to medium subrounded gravel, laminated, stiff to very stiff, red brown, dry to moist	649.9
5.0		
6.0		
7.0	— soft, red brown and gray	
8.0	SM-SAND, trace clay and silt, trace fine subrounded gravel, medium dense, gray, moist	646.0
9.0		
10.0		
11.0	SP-SAND(TILL), little to some fine subrounded gravel, dense, gray	642.9
	Spoon refusal @ 11.8 ft BGS, auger refusal @ 12.0 ft BGS)	641.9
12.0	END OF HOLE @ 12.0 FT. BGS	641.7
13.0		

NOTES:
1. At completion a 2" monitoring well was installed to 11.0 ft BGS.
2. Soil samples collected for chemical analysis from 0.0 to 2.0 ft BGS and 10.0 to 11.0 ft BGS for TCL/TCLP Metals, BNAs, VOCs and TOC, TPH AND 310.13.

MONITOR INSTALLATION



SAMPLE			
NUMBER	STATE	'N' VALUE	PID (ppm)
1SS	☒	7	6.4
2SS	☒	13	6
3SS	☒	33	40
4SS	☒	10	31
5SS	☒	21	37
6SS	☒	40	24

SCREEN DETAILS:
Screened Interval: 8.5 to 10.5' BGS
Length -2.0'
Diameter -2.0"
Slot # 10
Material -Stainless Steel
Sand pack interval: 7.0 to 11.0' BGS
Material -# 0 Morey

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

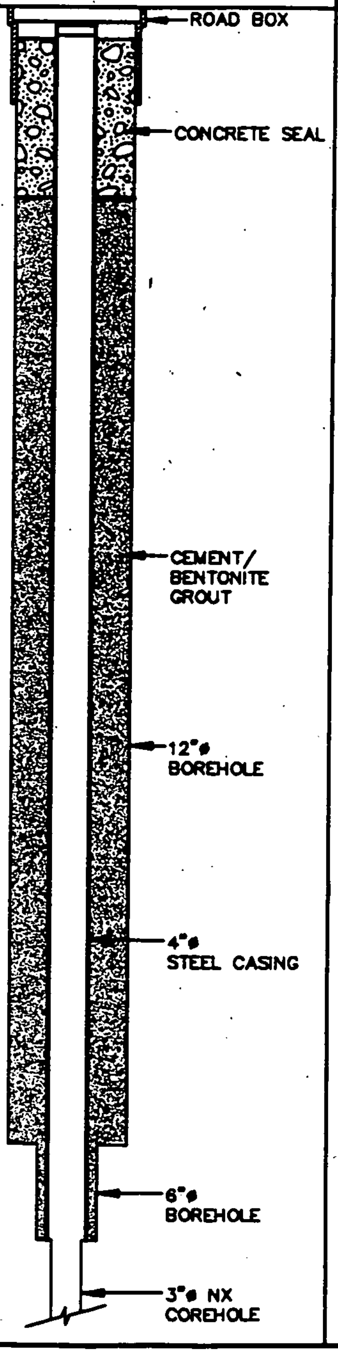
CHEMICAL ANALYSIS ○ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG
(OVERBURDEN)

(L-76)

PROJECT NAME: LEICA INC. RI/FS
PROJECT NO.: 3967
CLIENT: LEICA INC.
LOCATION: CHEEKTOWAGA, NEW YORK

HOLE DESIGNATION: MW-14A (Page 1 of 3)
DATE COMPLETED: DECEMBER 7, 1993
DRILLING METHOD: 8 1/4" ID HSA / WET ROTARY
CRA SUPERVISOR: K. LYNCH

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE	SAMPLE PID (ppm)
	REFERENCE POINT (Top of Riser) GROUND SURFACE	653.70 654.0					
	For overburden stratigraphy see MW-14						
1.0							
2.0							
3.0							
4.0							
5.0							
6.0							
7.0							
8.0							
9.0							
10.0							
11.0							
12.0	BEDROCK — wet rotary to 12.9 ft BGS	642.1					
13.0	END OF OVERBURDEN HOLE @ 12.9 FT BGS	641.1					

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

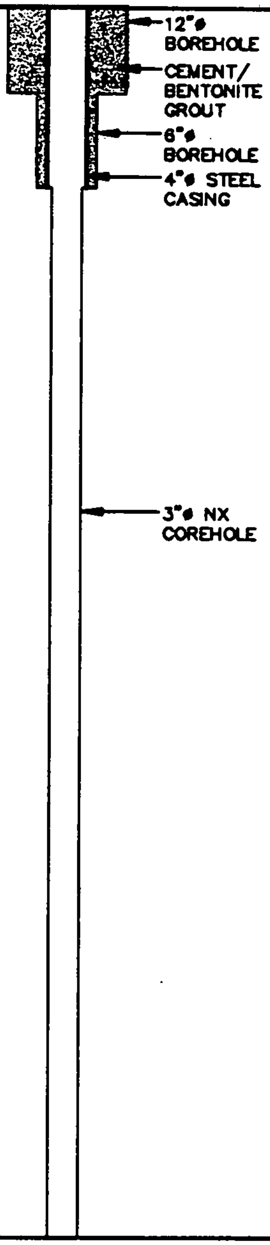
CHEMICAL ANALYSIS ○ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG
(BEDROCK)

(L-77)

PROJECT NAME: LEICA INC. RI/FS
PROJECT NO.: 3967
CLIENT: LEICA INC.
LOCATION: CHEEKTOWAGA, NEW YORK

HOLE DESIGNATION: MW-14A (Page 2 of 3)
DATE COMPLETED: DECEMBER 7, 1993
DRILLING METHOD: 8 1/4" ID HSA / WET ROTARY
CRA SUPERVISOR: K. LYNCH

DEPTH	DESCRIPTION OF STRATA	ELEVATION	MONITOR	BEDROCK INTERVAL	RUN NUMBER	CORE RECOVERY	RQD	WATER RETURN
ft BGS		ft. AMSL				%	%	%
	Overburden		 12"ø BOREHOLE CEMENT/ BENTONITE GROUT 6"ø BOREHOLE 4"ø STEEL CASING 3"ø NX COREHOLE					
12.0	LIMESTONE(Onondaga Formation, Moorehouse Member): light gray, fine grained, slightly to moderately weathered, trace vertical fractures, massively bedded, trace coral, some chert, stylolites, some carbonaceous partings	642.1			WR			
13.0	- slightly weathered break (@ 13.0 ft BGS) - weathered zone, dark chert (13.4 to 13.6 ft BGS)							
14.0	- brachiopod fossil (@ 14.0 ft BGS) - coral (14.4 to 14.5 ft BGS) - medium grained, buff, pink and gray, trace coral (15.0 to 15.4 ft BGS)				1	90	52.0	90
15.0	- dark chert nodule (15.7 to 15.9 and 16.4 to 16.7 ft BGS)							
16.0								
17.0	- small crystal filled vug (@ 16.8 ft BGS) - shale layer, banding (@ 17.0 ft BGS)							
18.0	- stylolite parting (@ 18.4 ft BGS) - coral (18.8 to 18.9 ft BGS)							
19.0	- stylolite parting (@ 19.2 ft BGS) - dark detrital layer between two stylolites (19.7 to 19.9 ft BGS)							
20.0					2	100	74.0	40
21.0	- moderately weathered break (@ 20.7 ft BGS) - slightly weathered break (@ 21.7 ft BGS)							
22.0	- fan coral (22.1 to 22.4 ft BGS)							
23.0	- heavily weathered zone, rubble (23.2 to 23.4 and 23.6 to 23.8 ft BGS)							

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

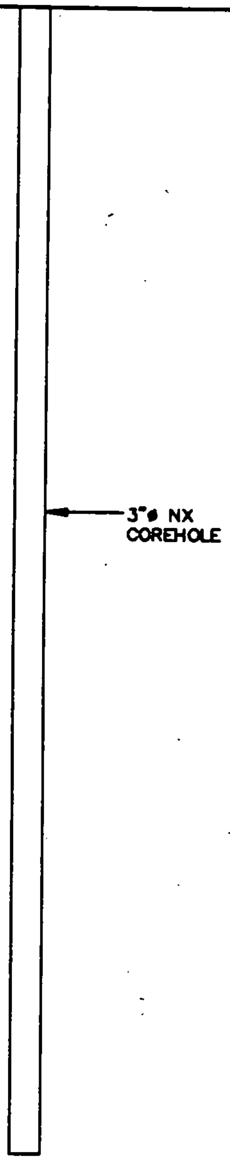
▽ WATER FOUND   ▼ STATIC WATER LEVEL   NM - NOT MEASURED

(L-77)

STRATIGRAPHIC AND INSTRUMENTATION LOG
(BEDROCK)

PROJECT NAME: LEICA INC. RI/FS
PROJECT NO.: 3967
CLIENT: LEICA INC.
LOCATION: CHEEKTOWAGA, NEW YORK

HOLE DESIGNATION: MW-14A (Page 3 of 3)
DATE COMPLETED: DECEMBER 7, 1993
DRILLING METHOD: 8 1/4" ID HSA / WET ROTARY
CRA SUPERVISOR: K. LYNCH

DEPTH	DESCRIPTION OF STRATA	ELEVATION	MONITOR	BEDROCK INTERVAL	RUN NUMBER	CORE RECOVERY	RQD	WATER RETURN
ft BGS		ft. AMSL				%	%	%
24.0					2	100	74.0	40
25.0								
	– slightly weathered break (@ 25.7 and 25.9 ft BGS)							
26.0								
	– moderately weathered break (@ 26.5 ft BGS)							
27.0	– rugose coral (26.8 to 27.0 ft BGS)							
	– slightly weathered break (@ 27.6 ft BGS)							
28.0								
	– solution pitting (28.4 to 28.5 ft BGS)							
29.0	– small coral (@ 29.0 ft BGS)							
	– slightly weathered break (@ 29.5, 29.6, 30.3 ft BGS)							
30.0	– coral (29.8 to 30.0 ft BGS)				3	101	95.0	5
31.0	– massive fan coral, open veins, weathered, stained, fuel oil odor (31.1 to 32.0 ft BGS)							
32.0								
	– coral break, moderately weathered, open veins, fuel oil odor (@ 32.7 ft BGS)							
33.0	– frequent small coral, open veins, slight fuel oil odor (33.4 to 35.0 ft BGS)							
34.0								
35.0	END OF HOLE @ 35.0 FT. BGS	619.0						

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

▽ WATER FOUND ▼ STATIC WATER LEVEL NM – NOT MEASURED

STRATIGRAPHIC AND INSTRUMENTATION LOG
(OVERBURDEN)

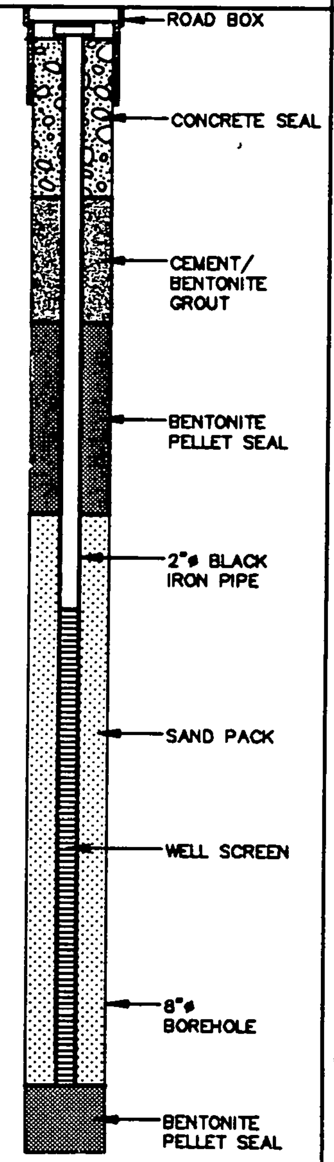
(L-78)

PROJECT NAME: LEICA INC. RI/FS
PROJECT NO.: 3967
CLIENT: LEICA INC.
LOCATION: CHEEKTOWAGA, NEW YORK

HOLE DESIGNATION: MW-15
DATE COMPLETED: DECEMBER 14, 1993
DRILLING METHOD: 4 1/4" ID HSA
CRA SUPERVISOR: K. LYNCH

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	SAMPLE NUMBER	STATE	'N' VALUE	PID (ppm)
	REFERENCE POINT (Top of Riser)	*658.35*				
	GROUND SURFACE	*658.7*				
	Augered through asphalt and pavement					
	SP-SAND(FILL), some gravel, brown, moist	*658.2*				
1.0			1SS		9	0
	ML-SILT, little sand and clay, brown, moist	*657.0*				
2.0	ML-SILT(NATIVE), little to some clay, little sand, trace fine subrounded gravel, very stiff, laminated, red brown, dry to moist	*656.7*				
3.0			2SS		21	0
4.0						
5.0			3SS		22	0.6
6.0						
	- softer					
7.0			4SS		23	0
	SM-SAND, little silt, trace fine rounded gravel, fine to medium grained, gray, moist to wet, no sheen, no odor	*651.1*				
8.0						
9.0			5SS		6	0
10.0						
11.0			6SS		52	0
	SM-SAND(TILL), some silt, little gravel, very dense, brown, dry	*647.4*				
12.0	END OF HOLE @ 12.0 FT. BGS NOTES: 1. At completion a 2" monitoring well was installed to 11.3 ft BGS. 2. Soil samples retained for geologic record.	*646.7*				
13.0						

MONITOR INSTALLATION



SCREEN DETAILS:
Screened Interval: 6.3 to 11.3' BGS
Length -5.0'
Diameter -2.0"
Slot # 10
Material -Stainless Steel
Sand pack interval: 5.3 to 11.3' BGS
Material -# 0 Morey

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

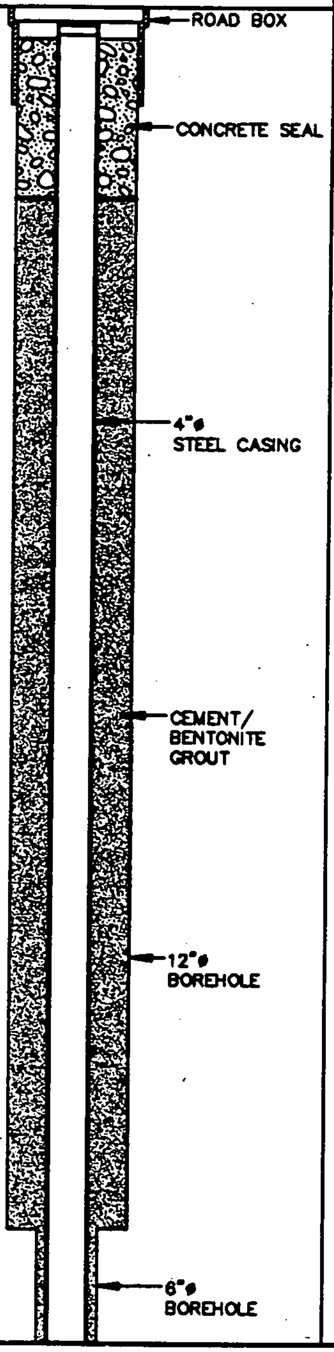
CHEMICAL ANALYSIS ○ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG
(OVERBURDEN)

(L-79)

PROJECT NAME: LEICA INC. RI/FS
PROJECT NO.: 3967
CLIENT: LEICA INC.
LOCATION: CHEEKTOWAGA, NEW YORK

HOLE DESIGNATION: MW-15A (Page 1 of 4)
DATE COMPLETED: DECEMBER 16, 1993
DRILLING METHOD: 8 1/4" ID HSA / WET ROTARY
CRA SUPERVISOR: K. LYNCH

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE	SAMPLE PID (ppm)
	REFERENCE POINT (Top of Riser)	*658.51*					
	GROUND SURFACE	*658.8*					
	For overburden stratigraphy see MW-15						
1.0							
2.0							
3.0							
4.0							
5.0							
6.0							
7.0							
8.0							
9.0							
10.0							
11.0							
12.0							
13.0	BEDROCK – wet rotary to 14.4 ft BGS	*646.0*					

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

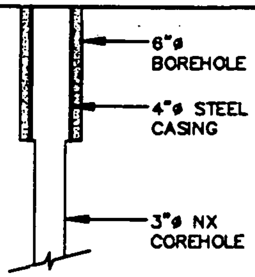
CHEMICAL ANALYSIS ⬭ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG
(OVERBURDEN)

(L-79)

PROJECT NAME: LEICA INC. RI/FS
PROJECT NO.: 3967
CLIENT: LEICA INC.
LOCATION: CHEEKTOWAGA, NEW YORK

HOLE DESIGNATION: MW-15A (Page 2 of 4)
DATE COMPLETED: DECEMBER 16, 1993
DRILLING METHOD: 8 1/4" ID HSA / WET ROTARY
CRA SUPERVISOR: K. LYNCH

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	MONITOR INSTALLATION	SAMPLE			
				NUMBER	STATE	'N' VALUE	PID (ppm)
14.0							
	END OF OVERBURDEN HOLE @ 14.4 FT BGS	644.4					
15.0							
16.0							
17.0							
18.0							
19.0							
20.0							
21.0							
22.0							
23.0							
24.0							
25.0							
26.0							

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

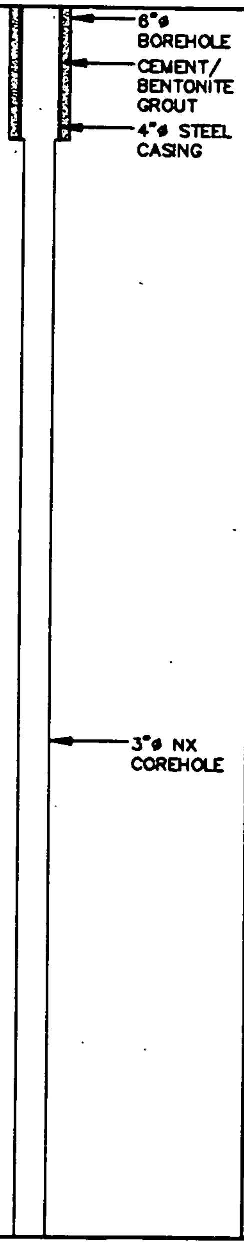
CHEMICAL ANALYSIS ○ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG (BEDROCK)

(L-80)

PROJECT NAME: LEICA INC. RI/FS
PROJECT NO.: 3967
CLIENT: LEICA INC.
LOCATION: CHEEKTOWAGA, NEW YORK

HOLE DESIGNATION: MW-15A (Page 3 of 4)
DATE COMPLETED: DECEMBER 6, 1993
DRILLING METHOD: 8 1/4" ID HSA / WET ROTARY
CRA SUPERVISOR: K. LYNCH

DEPTH	DESCRIPTION OF STRATA	ELEVATION	MONITOR INSTALLATION	BEDROCK INTERVAL	RUN NUMBER	CORE RECOVERY	RQD	WATER RETURN
ft BGS		ft. AMSL				%	%	%
	Overburden							
14.0	LIMESTONE(Onondaga Formation, Moorehouse Member): light gray, fine grained, slightly to moderately weathered, trace vertical fractures, massively bedded, trace coral, some chert, stylolites, some carbonaceous partings	646.0			WR			
15.0	- moderately weathered, some rubble, trace coral (14.4 to 15.0 ft BGS) - moderately weathered fracture (@ 15.8 and 17.9 ft BGS)							
16.0	- detrital layers, medium grained, little fossil/coral fragments (15.8 to 16.0, 16.4 to 16.6 and 16.8 to 17.6 ft BGS) - large brachiopod (@ 16.6 ft BGS)							
17.0	- moderately weathered caronaceous parting (@ 16.8 ft BGS) - slightly weathered carbonaceous parting (@ 17.6 ft BGS)							
18.0	- brown chert nodule, calcite veinlets (17.8 to 18.6 ft BGS) - light gray, medium grained, frequent coral fragments (17.9 to 20.2 ft BGS)				1	78	78.0	60
19.0	- moderately weathered carbonaceous parting (@ 18.1 and 18.2 ft BGS) - heavily weathered fracture (@ 18.5 ft BGS) - brown and white calcite (18.6 to 18.8 ft BGS)							
20.0	- coral, open veins, white (18.8 to 19.0 ft BGS) - rugose coral (19.0 to 19.1 ft BGS) - brachiopods (@ 19.2 ft BGS)							
21.0	- rugose coral outline, open pores, crescent shaped (19.3 to 19.4 ft BGS) - coral (19.9 to 20.2 ft BGS) - weathered fracture, rubble (@ 21.1 ft BGS)							
22.0	- heavily weathered zone (21.1 to 22.0 ft BGS) - lighter colored, medium grained, detrital, trace small coral (22.0 to 26.0 ft BGS)							
23.0	- moderately weathered carbonaceous parting (@ 24.0 to 24.3 ft BGS)							
24.0					2	100	69.0	0
25.0	- coral, slight yellow discoloration, weathered (24.8 to 25.0 ft BGS)							

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

▽ WATER FOUND ▼ STATIC WATER LEVEL NM – NOT MEASURED

STRATIGRAPHIC AND INSTRUMENTATION LOG
(BEDROCK)

(L-80)

PROJECT NAME: LEICA INC. RI/FS
PROJECT NO.: 3967
CLIENT: LEICA INC.
LOCATION: CHEEKTOWAGA, NEW YORK

HOLE DESIGNATION: MW-15A (Page 4 of 4)
DATE COMPLETED: DECEMBER 6, 1993
DRILLING METHOD: 8 1/4" ID HSA / WET ROTARY
CRA SUPERVISOR: K. LYNCH

DEPTH	DESCRIPTION OF STRATA	ELEVATION	MONITOR INSTALLATION	BEDROCK INTERVAL	RUN NUMBER	CORE RECOVERY	RQD	WATER RETURN
ft BGS		ft. AMSL				%	%	%
	– darker gray, medium grained, detrital layers, occasional coral, fossil fragments, numerous slightly weathered breaks (25.6 to 28.5 ft BGS)				2	100	69.0	0
26.0								
27.0	– vertical fractures, slightly weathered (27.3 to 27.7 ft BGS)							
28.0								
					3	100	71.0	0
29.0								
30.0	– slightly weathered fracture(@ 29.9 ft BGS) – light brown to buff chert, fine grained, several calcite filled veinlets (29.9 to 30.7 ft BGS)		3"ø NX COREHOLE					
31.0	– medium gray, trace stylolites, light to dark gray mottling (30.7 to 34.3 ft BGS)							
32.0	– 35 to 45° inclined carbonaceous partings and bedding (@ 31.8, 32.3 and 32.4 ft BGS)							
33.0								
					4	100	94.0	0
34.0	– brown chert nodule (34.3 to 34.6 ft BGS)							
35.0	– buff chert nodules (35.2 to 36.0 ft BGS)							
36.0	END OF HOLE @ 36.0 FT. BGS	622.8						
37.0								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

▽ WATER FOUND ▼ STATIC WATER LEVEL NM – NOT MEASURED

STRATIGRAPHIC AND INSTRUMENTATION LOG
(OVERBURDEN)

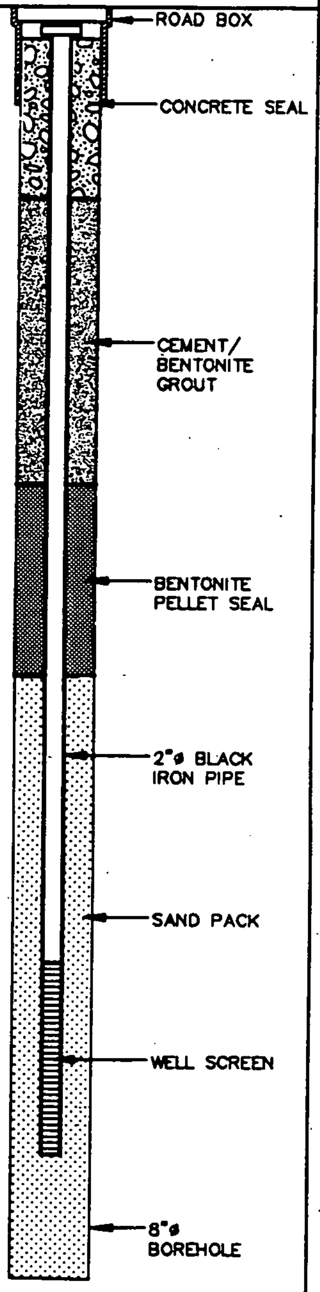
(L-81)

PROJECT NAME: LEICA INC. RI/FS
PROJECT NO.: 3967
CLIENT: LEICA INC.
LOCATION: CHEEKTOWAGA, NEW YORK

HOLE DESIGNATION: MW-16 (Page 1 of 2)
DATE COMPLETED: DECEMBER 15, 1993
DRILLING METHOD: 4 1/4" ID HSA
CRA SUPERVISOR: K. LYNCH

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE	SAMPLE PID (ppm)
	REFERENCE POINT (Top of Riser) GROUND SURFACE	659.89 660.2				
	SM-SAND(FILL), some silt, little gravel, dry to moist, no odor					
1.0			1SS	☒	67	8.1
	- gray cement, weathered					
2.0	ML-SILT(NATIVE), some clay, little sand and fine round gravel, red brown, dry to moist, slightly musty odor	658.2				
3.0			2SS	☒	24	6.2
4.0						
5.0			3SS	☒	30	6
6.0						
	SM-SAND, little silt and clay, brown, moist	653.5				
7.0	SW-SAND, fine to medium grained, brown, moist to wet, slight to some odor	653.1	4SS	☒	20	6
8.0						
9.0			5SS	☒	76	55
10.0						
			6SS	☒	>100	60
11.0	SP-SAND(TILL), some fine subrounded gravel, very stiff, dry to moist, sharp odor	649.3				
12.0						
13.0			7SS	☒	>100	22
	END OF HOLE @ 13.3 FT. BGS	646.9				

MONITOR INSTALLATION



NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS ⬭ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG
(OVERBURDEN)

(L-81)

PROJECT NAME: LEICA INC. RI/FS
PROJECT NO.: 3967
CLIENT: LEICA INC.
LOCATION: CHEEKTOWAGA, NEW YORK

HOLE DESIGNATION: MW-16
(Page 2 of 2)
DATE COMPLETED: DECEMBER 16, 1993
DRILLING METHOD: 4 1/4" ID HSA
CRA SUPERVISOR: K. LYNCH

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	MONITOR INSTALLATION	SAMPLE			
				NUMBER	STATE	'N' VALUE	PID (ppm)
	NOTES: 1. At completion a 2" monitoring well was installed to 12.0 ft BGS. 2. Soil samples retained for geologic record. Chemical analysis sample collected from BH-EDW1-93, 16.0 ft northwest.		SCREEN DETAILS: Screened Interval: 10.0 to 12.0' BGS Length -2.0' Diameter -2.0" Slot # 10 Material -Stainless Steel Sand pack interval: 7.0 to 13.3' BGS Material -# 0 Morey				
14.0							
15.0							
16.0							
17.0							
18.0							
19.0							
20.0							
21.0							
22.0							
23.0							
24.0							
25.0							
26.0							

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS ○ WATER FOUND ▽ STATIC WATER LEVEL ▼

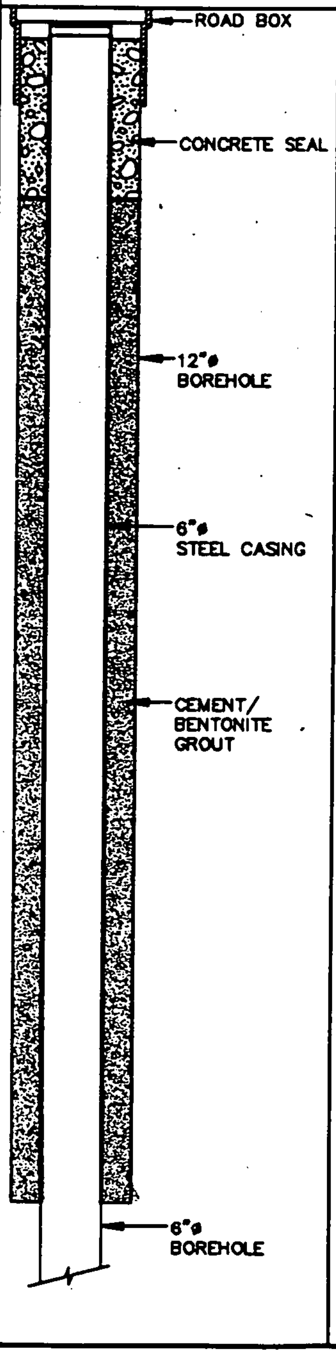
STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(L-82)

PROJECT NAME: LEICA INC. RI/FS
PROJECT NO.: 3967
CLIENT: LEICA INC.
LOCATION: CHEEKTOWAGA, NEW YORK

HOLE DESIGNATION: MW-16A (Page 1 of 4)
DATE COMPLETED: APRIL 7, 1994
DRILLING METHOD: 8 1/4" ID HSA / WET ROTARY
CRA SUPERVISOR: K. LYNCH

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE	SAMPLE PID (ppm)
	REFERENCE POINT (Top of Riser) GROUND SURFACE	659.95 660.3					
	For overburden stratigraphy see MW-16						
1.0							
2.0							
3.0							
4.0							
5.0							
6.0							
7.0							
8.0							
9.0							
10.0							
	BEDROCK – wet rotary to 12.58 BGS	649.7					
11.0							
12.0							
	END OF OVERBURDEN HOLE @ 12.5 FT BGS	647.8					
13.0							



NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

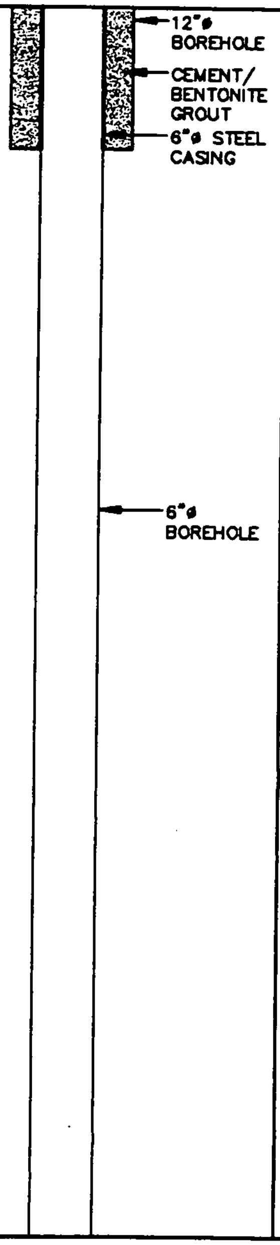
CHEMICAL ANALYSIS ○ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG (BEDROCK)

(L-83)

PROJECT NAME: LEICA INC. RI/FS
PROJECT NO.: 3967
CLIENT: LEICA INC.
LOCATION: CHEEKTOWAGA, NEW YORK

HOLE DESIGNATION: MW-16A (Page 2 of 4)
DATE COMPLETED: APRIL 7, 1994
DRILLING METHOD: 8 1/4" ID HSA/ WET ROTARY
CRA SUPERVISOR: K. LYNCH

DEPTH	DESCRIPTION OF STRATA	ELEVATION	MONITOR INSTALLATION	BEDROCK INTERVAL	RUN NUMBER	CORE RECOVERY	RQD	WATER RETURN
ft BGS		ft. AMSL				%	%	%
	Overburden							
12.0	LIMESTONE(Onondaga Formation, Moorehouse Member): light gray, fine grained, slightly to moderately weathered, trace vertical fractures, massively bedded, trace coral, some chert, stylolites, some carbonaceous partings	649.7	 12"ø BOREHOLE CEMENT/ BENTONITE GROUT 6"ø STEEL CASING 6"ø BOREHOLE		WR			
13.0	– heavily weathered zone, rubble (12.5 to 17.0 ft BGS)							
14.0								
15.0								
16.0								
17.0	– rock more intact, good RQD (17.0 to 20.8 ft BGS)				1	59	39.0	50
18.0	– buff colored chert (17.9 to 18.4 ft BGS)							
19.0								
20.0								
21.0	– heavily weathered zone, rubble, little dark chert, mud zone (20.8 to 22.0 ft BGS)							
22.0	– rubble zone, heavily weathered, trace to little dark chert (22.0 to 24.0 ft BGS)							
23.0					2	85	0.0	0

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

▽ WATER FOUND ▼ STATIC WATER LEVEL NM – NOT MEASURED

STRATIGRAPHIC AND INSTRUMENTATION LOG
(BEDROCK)

(L-83)

PROJECT NAME: LEICA INC. RI/FS
PROJECT NO.: 3967
CLIENT: LEICA INC.
LOCATION: CHEEKTOWAGA, NEW YORK

HOLE DESIGNATION: MW-16A (Page 3 of 4)
DATE COMPLETED: APRIL 7, 1994
DRILLING METHOD: 8 1/4" ID HSA/ WET ROTARY
CRA SUPERVISOR: K. LYNCH

DEPTH	DESCRIPTION OF STRATA	ELEVATION	MONITOR INSTALLATION	BEDROCK INTERVAL	RUN NUMBER	CORE RECOVERY	RQD	WATER RETURN
ft BGS		ft. AMSL				%	%	%
	– mud filled vertical fracture, chemical odor (23.5 to 23.7 ft BGS)				2	85	0.0	0
24.0	– rubble zone, heavily weathered, trace coral, little dark chert (24.0 to 25.3 ft BGS)							
25.0	– dark chert (25.3 to 25.9 ft BGS)							
26.0	– light gray chert (25.9 to 26.3 ft BGS)							
	– trace clacite and coral (@ 26.7 ft BGS)							
27.0	– brachiopod (@ 27.4 ft BGS) – dark chert (27.4 to 28.6 ft BGS)							
28.0					3	89	71.0	0
	– rugose coral, solitary, closed vein, detrital layer (28.6 to 29.2 ft BGS)		6"ø BOREHOLE					
29.0	– dark to buff chert, carbonaceous partings (29.2 to 29.8 ft BGS)							
30.0	– coral (30.4 to 30.5 ft BGS)							
	– buff colored chert (30.8 to 32.0 ft BGS)							
31.0								
32.0	– medium gray chert (32.0 to 33.0 ft BGS) – chert, light to medium gray (32.0 to 33.5 ft BGS)							
33.0	– carbonaceous parting (@ 33.3 ft BGS)							
34.0	– coral, open veins (33.9 to 34.0 ft BGS)				4	106	87.0	0
35.0								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

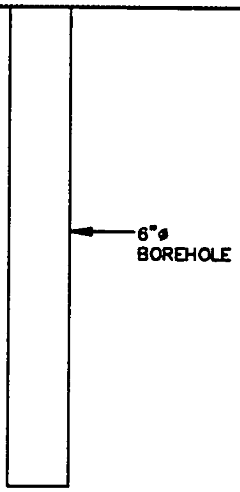
▽ WATER FOUND ▼ STATIC WATER LEVEL NM – NOT MEASURED

STRATIGRAPHIC AND INSTRUMENTATION LOG (BEDROCK)

(L-83)

PROJECT NAME: LEICA INC. RI/FS
PROJECT NO.: 3967
CLIENT: LEICA INC.
LOCATION: CHEEKTOWAGA, NEW YORK

HOLE DESIGNATION: MW-16A (Page 4 of 4)
DATE COMPLETED: APRIL 7, 1994
DRILLING METHOD: 8 1/4" ID HSA/ WET ROTARY
CRA SUPERVISOR: K. LYNCH

DEPTH	DESCRIPTION OF STRATA	ELEVATION	MONITOR INSTALLATION	BEDROCK INTERVAL	RUN NUMBER	CORE RECOVERY	RQD	WATER RETURN
ft BGS		ft. AMSL				%	%	%
	– buff colored chert (35.5 to 40.0 ft BGS)							
36.0								
37.0					4	106	87.0	0
38.0								
39.0								
40.0	END OF HOLE @ 40.0 FT. BGS	620.3						
41.0								
42.0								
43.0								
44.0								
45.0								
46.0								
47.0								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

▽ WATER FOUND ▼ STATIC WATER LEVEL NM – NOT MEASURED

STRATIGRAPHIC AND INSTRUMENTATION LOG
(OVERBURDEN)

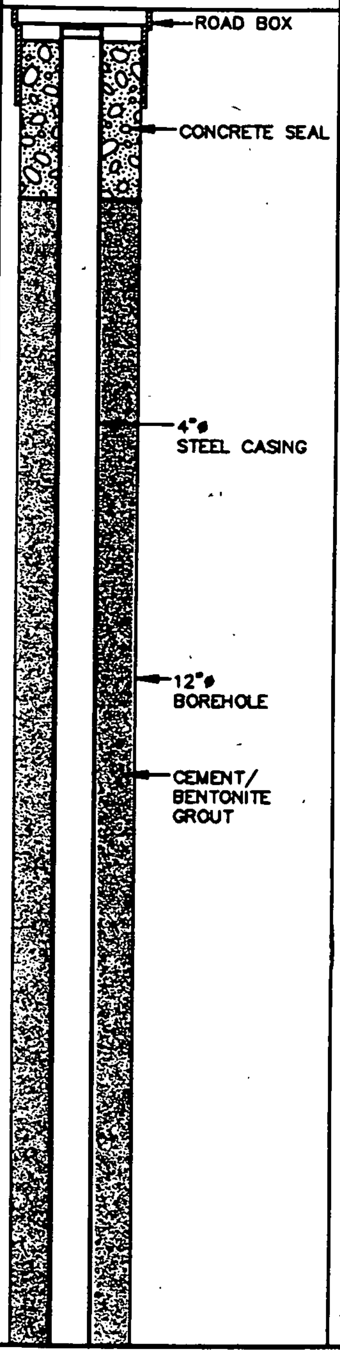
(L-84)

PROJECT NAME: LEICA INC. RI/FS
PROJECT NO.: 3967
CLIENT: LEICA INC.
LOCATION: CHEEKTOWAGA, NEW YORK

HOLE DESIGNATION: MW-17A (Page 1 of 5)
DATE COMPLETED: APRIL 7, 1994
DRILLING METHOD: 8 1/4" ID HSA
CRA SUPERVISOR: K. LYNCH

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE	SAMPLE PID (ppm)
	REFERENCE POINT (Top of Riser) GROUND SURFACE	659.18 659.5				
	Auger through two asphalt layers					
1.0	SM-SAND(FILL), some silt and gravel, dark brown, dry to moist	658.5				
	ML-SILT(NATIVE), some clay, little sand and fine gravel, very stiff, red brown, dry	657.9				
2.0			1SS		14	0
3.0						
4.0			2SS		31	0
5.0	SP-SAND, trace fine rounded gravel, fine to medium grained, gray and brown, moist to wet	654.7				
6.0			3SS		36	0
	– wet					
7.0						
8.0			4SS		49	0
9.0						
10.0			5SS		85	0
11.0						
12.0			6SS		34	0
13.0						
			7SS		48	0

MONITOR INSTALLATION



NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS ○ WATER FOUND ▽ STATIC WATER LEVEL ▼

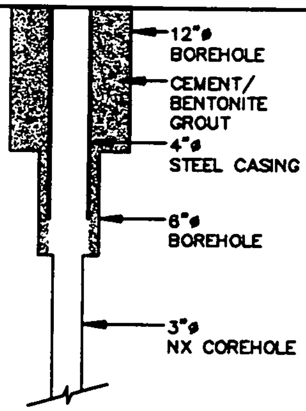
(L-84)

STRATIGRAPHIC AND INSTRUMENTATION LOG
(OVERBURDEN)

PROJECT NAME: LEICA INC. RI/FS
PROJECT NO.: 3967
CLIENT: LEICA INC.
LOCATION: CHEEKTOWAGA, NEW YORK

HOLE DESIGNATION: MW-17A (Page 2 of 5)
DATE COMPLETED: APRIL 7, 1994
DRILLING METHOD: 8 1/4" ID HSA
CRA SUPERVISOR: K. LYNCH

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	MONITOR INSTALLATION	SAMPLE			
				NUMBER	STATE	'N' VALUE	PID (ppm)
	CL-CLAY, some silt, very stiff, gray, moist	646.1 645.9		7SS		48	0
14.0	SM-SAND(TILL), some silt, little fine gravel, very dense, brown and gray, dry to moist						
	BEDROCK – wet rotary to 15.6 ft BGS	645.0					
15.0							
	END OF OVERBURDEN HOLE @ 15.6 FT BGS NOTES: 1. Soil samples retained for geologic record. 2. Bulk samples collected for grain size analysis form 9.0 to 13.0 ft BGS. 3. At completion a 4" thick steel casing was installed to 15.2 ft BGS for bedrock drilling.	643.9					
16.0							
17.0							
18.0							
19.0							
20.0							
21.0							
22.0							
23.0							
24.0							
25.0							
26.0							



NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

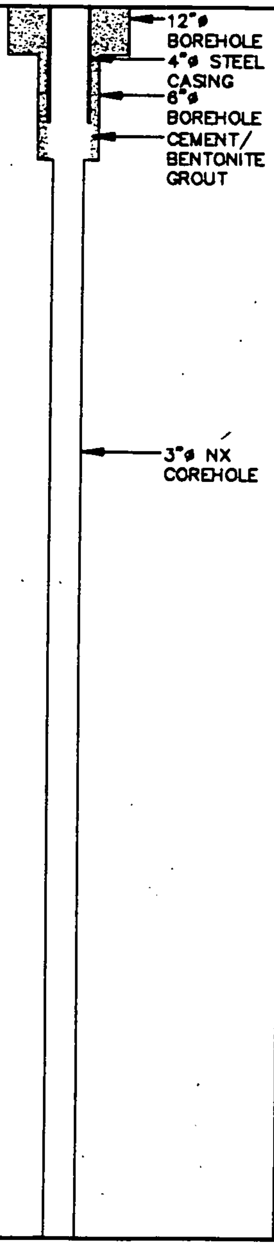
CHEMICAL ANALYSIS ○ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG (BEDROCK)

(L-85)

PROJECT NAME: LEICA INC. RI/FS
PROJECT NO.: 3967
CLIENT: LEICA INC.
LOCATION: CHEEKTOWAGA, NEW YORK

HOLE DESIGNATION: MW-17A (Page 3 of 5)
DATE COMPLETED: APRIL 7, 1994
DRILLING METHOD: 8 1/4" ID HSA / WET ROTARY
CRA SUPERVISOR: K. LYNCH

DEPTH	DESCRIPTION OF STRATA	ELEVATION	MONITOR INSTALLATION	BEDROCK INTERVAL	RUN NUMBER	CORE RECOVERY	RQD	WATER RETURN
ft BGS		ft. AMSL				%	%	%
	Overburden							
15.0	LIMESTONE(Onondaga Formation, Moorehouse Member): light gray, fine grained, slightly to moderately weathered, trace vertical fractures, massively bedded, trace coral, some chert, stylolites, some carbonaceous partings – coral fossil, rugose (16.1 ft BGS) – brachiopod (@ 16.6 ft BGS) – moderately weathered zone, vertical fracture (16.6 to 17.4 ft BGS) – carbonaceous parting (@ 17.9, 18.5 and 19.3 ft BGS)	643.9			WR			
16.0								
17.0								
18.0					1	100	67.0	80
19.0								
20.0								
21.0	– coral (20.7 to 20.9 ft BGS) – frequent small coral (21.0 to 21.7 ft BGS)							
22.0	– carbonaceous parting (21.8, 22.2, 22.4, @ 22.8 ft BGS) – dark chert (22.2 to 22.4 and 23.8 to 24.0 ft BGS)							
23.0								
24.0	– carbonaceous parting (24.3, 24.8, 25.8, 26.2 and 26.7 ft BGS)							
25.0								
26.0	– dark chert (25.8 to 26.0, 26.2 to 26.3, 26.7 to 27.2 and 27.8 to 28.0 ft BGS)				2	100	86.0	90

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

▽ WATER FOUND ▼ STATIC WATER LEVEL NM – NOT MEASURED

STRATIGRAPHIC AND INSTRUMENTATION LOG (BEDROCK)

(L-85)

PROJECT NAME: LEICA INC. RI/FS
PROJECT NO.: 3967
CLIENT: LEICA INC.
LOCATION: CHEEKTOWAGA, NEW YORK

HOLE DESIGNATION: MW-17A (Page 4 of 5)
DATE COMPLETED: APRIL 7, 1994
DRILLING METHOD: 8 1/4" ID HSA / WET ROTARY
CRA SUPERVISOR: K. LYNCH

DEPTH	DESCRIPTION OF STRATA	ELEVATION	MONITOR INSTALLATION	BEDROCK INTERVAL	RUN NUMBER	CORE RECOVERY	RQD	WATER RETURN
ft BGS		ft. AMSL				%	%	%
27.0								
28.0					2	100	86.0	90
29.0	– carbonaceous parting (@ 28.7 ft BGS) – dark chert (28.8 to 28.9 ft BGS) – small vug (@ 29.0 ft BGS) – dark chert (29.1 to 29.4 ft BGS) – coral (29.7 to 29.9 ft BGS)							
30.0								
31.0	– dark chert (30.6 to 30.9 ft BGS) – carbonaceous parting (@ 30.6, 32.2, 32.5, 32.7, 32.9 and 33.0 ft BGS) – carbonaceous partings (@ 33.6, 34.1, 34.5, 34.8, 35.3, 35.8, 36.0, 37.2 and 40.0 ft BGS)		← 3"ϕ NX COREHOLE					
32.0								
33.0								
34.0	– darker bands (33.9 to 34.0, 34.1 to to 34.5, 34.7 to 35.1, and 35.3 to 35.6)							
35.0								
36.0					3	99	87.0	90
37.0	– abundant light gray to buff colored chert (36.7 to 40.0 ft BGS)							
38.0								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

▽ WATER FOUND ▼ STATIC WATER LEVEL NM – NOT MEASURED

STRATIGRAPHIC AND INSTRUMENTATION LOG
(BEDROCK)

(L-85)

PROJECT NAME: LEICA INC. RI/FS
PROJECT NO.: 3967
CLIENT: LEICA INC.
LOCATION: CHEEKTOWAGA, NEW YORK

HOLE DESIGNATION: MW-17A (Page 5 of 5)
DATE COMPLETED: APRIL 7, 1994
DRILLING METHOD: 8 1/4" ID HSA / WET ROTARY
CRA SUPERVISOR: K. LYNCH

DEPTH	DESCRIPTION OF STRATA	ELEVATION	MONITOR INSTALLATION	BEDROCK INTERVAL	RUN NUMBER	CORE RECOVERY	RQD	WATER RETURN
ft BGS		ft. AMSL				%	%	%
39.0			3"ø NX COREHOLE					
40.0	END OF HOLE @ 40 FT. BGS	619.5						
41.0								
42.0								
43.0								
44.0								
45.0								
46.0								
47.0								
48.0								
49.0								
50.0								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

▽ WATER FOUND ▼ STATIC WATER LEVEL NM – NOT MEASURED

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

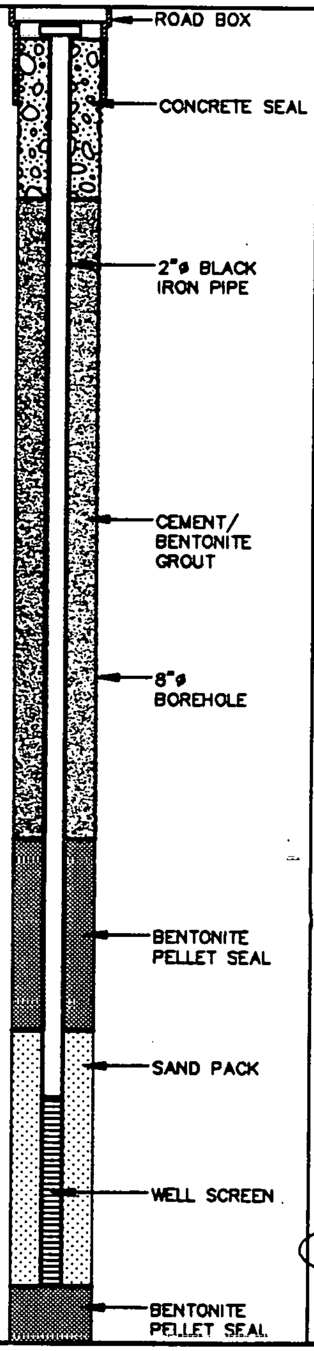
(L-86)

PROJECT NAME: LEICA INC. RI/FS
PROJECT NO.: 3967
CLIENT: LEICA INC.
LOCATION: CHEEKTOWAGA, NEW YORK

HOLE DESIGNATION: MW-18 (Page 1 of 2)
DATE COMPLETED: MARCH 30, 1994
DRILLING METHOD: 4 1/4" ID HSA
CRA SUPERVISOR: J. WILLIAMS

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE	SAMPLE PID (ppm)
	REFERENCE POINT (Top of Riser)	662.51				
	GROUND SURFACE	663.1				
	ML-SILT(FILL), some angular gravel, some medium to coarse sand, trace clay, stiff, dark brown and gray					
1.0			1SS		24	0
2.0						
3.0			2SS		14	0
4.0	CL-CLAY(NATIVE), some silt, trace rootlets, trace large gravel, soft to firm, gray and brown, moist	659.1				
5.0			3SS		10	0
6.0						
7.0			4SS		42	0
8.0	ML-SILT, some clay, some fine sand, brown and gray, moist	655.0				
9.0			5SS		26	0
10.0	CL-CLAY, little silt, very stiff, red brown, moist	653.1				
11.0	SM-SAND, little silt and subrounded gravel, fine to medium grained, brown and gray, wet	652.0	6SS		13	0
12.0						
13.0			7SS		4	0

MONITOR INSTALLATION



NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

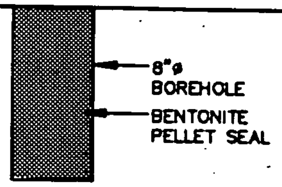
CHEMICAL ANALYSIS ⬭ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG
(OVERBURDEN)

(L-86)

PROJECT NAME: LEICA INC. RI/FS
PROJECT NO.: 3967
CLIENT: LEICA INC.
LOCATION: CHEEKTOWAGA, NEW YORK

HOLE DESIGNATION: MW-18 (Page 2 of 2)
DATE COMPLETED: MARCH 30, 1994
DRILLING METHOD: 4 1/4" ID HSA
CRA SUPERVISOR: J. WILLIAMS

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	MONITOR INSTALLATION	SAMPLE			
				NUMBER	STATE	'N' VALUE	PID (ppm)
14.0				8SS	☒	>100	0
15.0	END OF HOLE @ 14.8 FT. BGS NOTES: 1. At completion a 2" monitoring well was installed to 13.4 ft BGS. 2. Soil samples collected for chemical analysis from 13.5 to 14.3 ft BGS for TCL VOCs.	648.3	SCREEN DETAILS: Screened Interval: 11.4 to 13.4' BGS Length -2.0' Diameter -2.0" Slot # 10 Material -Stainless Steel Sand pack interval: 10.7 to 13.4' BGS Material -# 0 Morey				
16.0							
17.0							
18.0							
19.0							
20.0							
21.0							
22.0							
23.0							
24.0							
25.0							
26.0							

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS ○ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG
(OVERBURDEN)

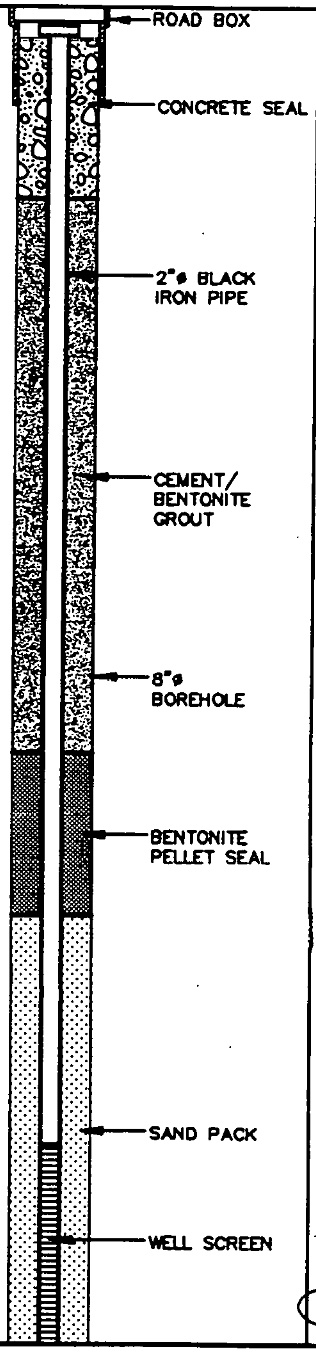
(L-87)

PROJECT NAME: LEICA INC. RI/FS
PROJECT NO.: 3967
CLIENT: LEICA INC.
LOCATION: CHEEKTOWAGA, NEW YORK

HOLE DESIGNATION: MW-19 (Page 1 of 2)
DATE COMPLETED: APRIL 7, 1994
DRILLING METHOD: 4 1/4" ID HSA
CRA SUPERVISOR: K. LYNCH

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE	SAMPLE PID (ppm)
	REFERENCE POINT (Top of Riser) GROUND SURFACE	660.84 661.3				
	Auger though asphalt					
	GP-GRAVEL(FILL), some coarse sand, black, wet	660.8				
1.0	SM-SAND(FILL), some silt, little fine to medium subrounded gravel, red brown to buff, dry to moist	660.2	1SS		15	0
2.0	– red brown and gray					
3.0			2SS		5	0
4.0						
5.0	OH-SILT(NATIVE), some loam, rootlets, dark gray, moist	656.4	3SS		10	0.2
6.0	ML-SILT, some clay, little sand and fine gravel, very stiff, laminated, red brown, dry	655.1				
7.0			4SS		32	0
8.0						
9.0	– some sand, little clay, very stiff, gray and brown, dry		5SS		31	0
10.0						
11.0			6SS		23	0
	SM-SAND, little silt, little fine rounded gravel, gray, moist to wet	649.7				
12.0						
13.0			7SS		>60	0

MONITOR INSTALLATION



NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

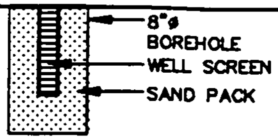
CHEMICAL ANALYSIS ○ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG
(OVERBURDEN)

(L-87)

PROJECT NAME: LEICA INC. RI/FS
PROJECT NO.: 3967
CLIENT: LEICA INC.
LOCATION: CHEEKTOWAGA, NEW YORK

HOLE DESIGNATION: MW-19 (Page 2 of 2)
DATE COMPLETED: APRIL 7, 1994
DRILLING METHOD: 4 1/4" ID HSA
CRA SUPERVISOR: K. LYNCH

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE	SAMPLE PID (ppm)
	Spoon refusal @ 13.7, auger refusal @ 14.3 ft BGS		 8"ø BOREHOLE WELL SCREEN SAND PACK	7SS		>60	0
14.0							
	END OF HOLE @ 14.3 FT. BGS NOTES: 1. At completion a 2" monitoring well was installed to 13.9 ft BGS. 2. Soil samples collected for chemical analysis from 12.5 to 13.7 ft BGS for TCL VOCs and TPH.	647.0	SCREEN DETAILS: Screened Interval: 11.9 to 13.9' BGS Length -2.0' Diameter -2.0" Slot # 10 Material -Stainless Steel Sand pack interval: 9.5 to 14.3' BGS Material -# 0 Morey				
15.0							
16.0							
17.0							
18.0							
19.0							
20.0							
21.0							
22.0							
23.0							
24.0							
25.0							
26.0							

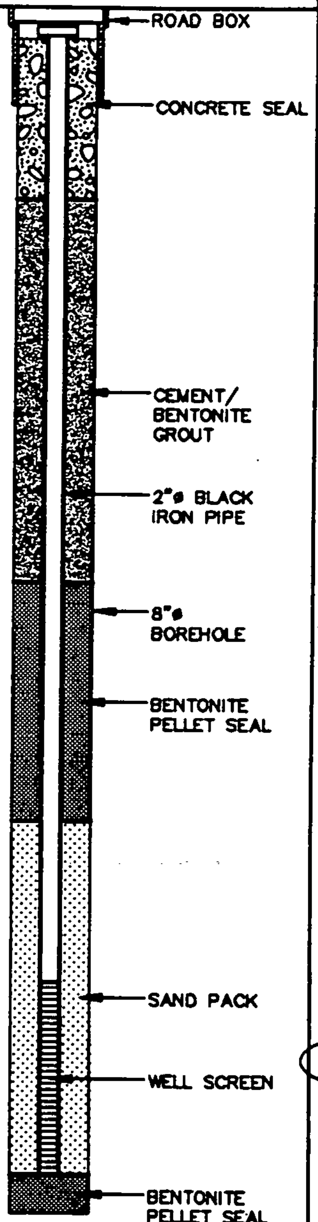
NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS ○ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(L-88)

PROJECT NAME: LEICA INC. RI/FS
PROJECT NO.: 3967
CLIENT: LEICA INC.
LOCATION: CHEEKTOWAGA, NEW YORK
HOLE DESIGNATION: MW-20
DATE COMPLETED: APRIL 5, 1994
DRILLING METHOD: 4 1/4" ID HSA
CRA SUPERVISOR: J. WILLIAMS



DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE	SAMPLE PID (ppm)
	REFERENCE POINT (Top of Riser) GROUND SURFACE	659.12 659.4				
	ML–SILT(FILL), little clay and roots, brown, moist					
1.0			1SS	☒	6	0.1
2.0						
3.0			2SS	☒	10	0.4
	CL–CLAY(NATIVE), some silt, trace subangular to subrounded gravel, very stiff, red brown, dry to moist	655.7				
4.0						
5.0			3SS	☒	25	0.2
6.0						
7.0			4SS	☒	29	1
8.0						
9.0			5SS	☒	14	0.4
10.0						
	SP–SAND, some rounded gravel, gray, wet	649.0				
11.0			6SS	☒	7	0.5
12.0						
	END OF HOLE @ 12.6 FT. BGS	646.8	7SS	☒	>100	0.5
13.0						

SCREEN DETAILS:
Screened Interval:
10.2 to 12.2' BGS
Length –2.0'
Diameter –2.0"
Slot # 10
Material –Stainless Steel
Sand pack interval:
8.5 to 12.2' BGS
Material –# 0 Morey

NOTES:
1. At completion a 2" monitoring well was installed to 12.2 ft BGS.
2. Soil samples collected for chemical analysis from 11.0 to 12.0 ft BGS for TCL VOCs.

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS ◯ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG
(OVERBURDEN)

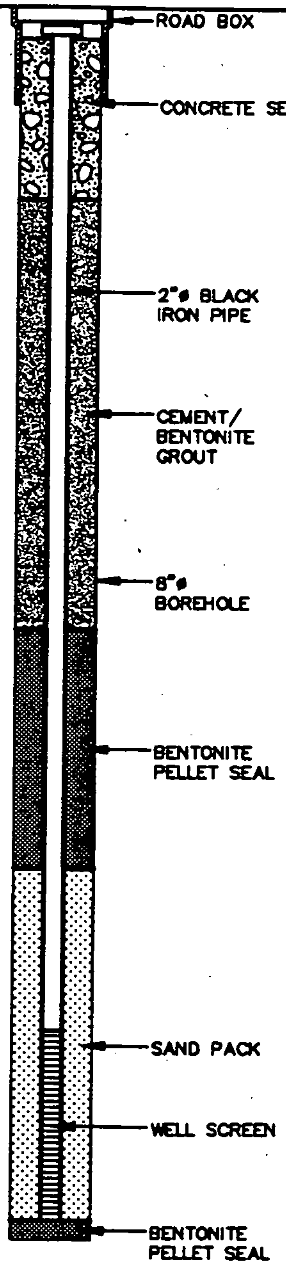
(L-89)

PROJECT NAME: LEICA INC. RI/FS
PROJECT NO.: 3967
CLIENT: LEICA INC.
LOCATION: CHEEKTOWAGA, NEW YORK

HOLE DESIGNATION: MW-21 (Page 1 of 2)
DATE COMPLETED: APRIL 4, 1994
DRILLING METHOD: 4 1/4" ID HSA
CRA SUPERVISOR: K. LYNCH

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE	SAMPLE PID (ppm)
	REFERENCE POINT (Top of Riser)	657.72				
	GROUND SURFACE	658.0				
	Auger through asphalt pavement					
1.0	GP-GRAVEL(FILL), some fine to medium sand, fine angular gravel, gray, moist	657.5	1SS		18	0
2.0	ML-SILT(NATIVE), little clay, trace fine sand, gray and brown, moist	656.5				
3.0	– some clay, trace sand and fine round gravel, very stiff, red brown, dry to moist		3SS		11	0
4.0						
5.0			3SS		27	0
6.0						
7.0			4SS		35	0
8.0						
9.0	– little sand and clay, trace fine gravel, medium stiff, soft, gray and brown, dry to moist		5SS		24	0.1
10.0	CH-CLAY, little silt, little sand, soft, gray, brown, moist	648.3				
11.0	SM-SAND, little silt, and fine subrounded gravel, gray, moist to wet	647.1	6SS		9	0.1
12.0			7SS		>100	0.1
13.0	END OF HOLE @ 12.8 FT. BGS	645.2				

MONITOR INSTALLATION



NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS ○ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG
(OVERBURDEN)

(L-89)

PROJECT NAME: LEICA INC. RI/FS
PROJECT NO.: 3967
CLIENT: LEICA INC.
LOCATION: CHEEKTOWAGA, NEW YORK

HOLE DESIGNATION: MW-21
(Page 2 of 2)
DATE COMPLETED: APRIL 4, 1994
DRILLING METHOD: 4 1/4" ID HSA
CRA SUPERVISOR: K. LYNCH

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	MONITOR INSTALLATION	SAMPLE			
				NUMBER	STATE	'N' VALUE	PID (ppm)
	NOTES: 1. At completion a 2" monitoring well was installed to 12.7 ft BGS. 2. Soil samples collected for chemical analysis from 11.0 to 12.0 ft BGS for TCL VOCS.		SCREEN DETAILS: Screened Interval: 10.7 to 12.7' BGS Length -2.0' Diameter -2.0" Slot # 10 Material -Stainless Steel Sand pack interval: 9.0 to 12.7' BGS Material -# 0 Morey				
14.0							
15.0							
16.0							
17.0							
18.0							
19.0							
20.0							
21.0							
22.0							
23.0							
24.0							
25.0							
26.0							

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS ○ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG
(OVERBURDEN)

(L-90)

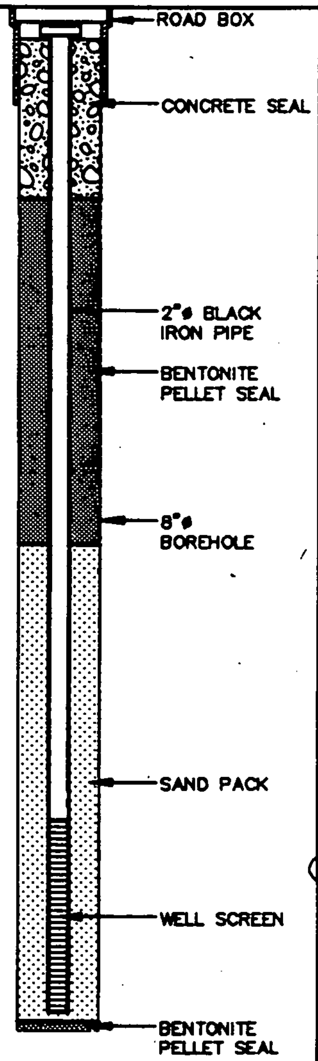
PROJECT NAME: LEICA INC. RI/FS
PROJECT NO.: 3967
CLIENT: LEICA INC.
LOCATION: CHEEKTOWAGA, NEW YORK

HOLE DESIGNATION: MW-22
DATE COMPLETED: MARCH 29, 1994
DRILLING METHOD: 4 1/4" ID HSA
CRA SUPERVISOR: K. LYNCH

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE	SAMPLE PID (ppm)
	REFERENCE POINT (Top of Riser)	652.51				
	GROUND SURFACE	652.9				
	ML-SILT(FILL), some sand, little clay, loose brown, moist					
1.0			1SS		3	0.2
	ML-SILT(NATIVE), some clay, trace sand, very dense, red brown, dry to moist	651.1				
2.0						
3.0			2SS		14	–
4.0						
5.0			3SS		18	–
	SM-SAND, little silt and clay, trace fine round gravel, gray, moist to wet	647.3				
6.0						
7.0			4SS		9	–
8.0						
9.0	– soft, wet, no sheen, no odor		5SS		40	–
	SP-SAND(TILL), some fine round gravel, very stiff, gray, dry to moist, no odor	643.6				
10.0			6SS		>100	–
	END OF HOLE @ 10.7 FT. BGS	642.2				
11.0						
12.0						
13.0						

NOTES:
1. At completion a 2" monitoring well was installed to 10.5 ft BGS.
2. Soil samples collected for chemical analysis from 8.5 to 9.5 ft BGS for TCL VOCS.
3. Bulk soil samples colllected from 2.0 to 4.0 ft BGS and 7.0 to 9.0 ft BGS, for grain size analysis.
4. PID not operative due to wet snow/rain.

MONITOR INSTALLATION



SCREEN DETAILS:
Screened Interval:
8.5 to 10.5' BGS
Length –2.0'
Diameter –2.0"
Slot # 10
Material –Stainless Steel
Sand pack interval:
5.6 to 10.6' BGS
Material –# 0 Morey

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

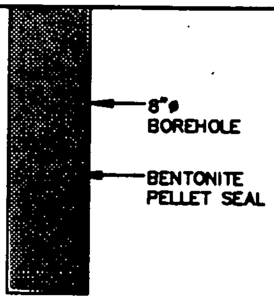
CHEMICAL ANALYSIS ○ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG
(OVERBURDEN)

(L-91)

PROJECT NAME: LEICA INC. RI/FS
PROJECT NO.: 3967
CLIENT: LEICA INC.
LOCATION: CHEEKTOWAGA, NEW YORK

HOLE DESIGNATION: MW-23 (Page 2 of 2)
DATE COMPLETED: MARCH 30, 1994
DRILLING METHOD: 4 1/4" ID HSA
CRA SUPERVISOR: K. LYNCH

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE	SAMPLE PID (ppm)
				7SS		63	NA
14.0							
15.0				8SS		58	NA
16.0	END OF HOLE @ 16.0 FT. BGS NOTES: 1. At completion a 2" monitoring well was installed to 13.5 ft BGS. 2. Soil samples collected for chemical analysis from 12.5 to 13.5 ft BGS for VOCS.	640.5	SCREEN DETAILS: Screened Interval: 11.5 to 13.5' BGS Length -2.0' Diameter -2.0" Slot # 10 Material -Stainless Steel Sand pack interval: 9.3 to 13.5' BGS Material -# 0 Morey				
17.0							
18.0							
19.0							
20.0							
21.0							
22.0							
23.0							
24.0							
25.0							
26.0							

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

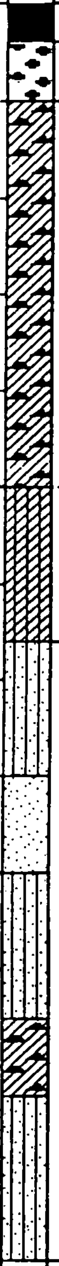
CHEMICAL ANALYSIS ○ WATER FOUND ▽ STATIC WATER LEVEL ▼

BOREHOLE LOG	**PROJECT:** 90-816	**BOREHOLE:** 1
PHASE II SUBSOIL INVESTIGATION CHEEKTOWAGA, NEW YORK FOR: Leica Inc.		**DATE:** 22 October 1990 **GEOLOGIST** TEJ

DEPTH (ft)	STRATIGRAPHY	STRATIGRAPHIC DESCRIPTION GROUND ELEVATION 660.02	MONITOR DETAILS & NUMBER	SAMPLE NUMBER	SAMPLE INTERVAL	SAMPLE TYPE	SAMPLE N VALUE	SAMPLE % WATER	SAMPLE % REC	SAMPLE % RQD	COMMENTS
0.4		**ASPHALT**									
1		**SUB-BASE** Grey sandy gravel, moist, loose.		1		SS	6		45		
1.5											
2		**SILTY CLAY TILL** Red silty clay, trace fine to medium gravel and fine sand, DTPL, firm.									OVA rdg.= 0.1
3		-Sand and gravel fraction increasing with depth.		2		SS	6		45		
4											OVA rdg.= NIL
5.0 5		**FINE SAND** Brown fine sand, trace gravel, moist to wet, compact. Trace orange colored staining between about 5.9 and 7.0 ft. -Very high fine gravel content from about 5.0 to 5.9 ft.		3		SS	10		85		
5.9 6											OVA rdg.= 2.0
7.0 7		**SILTY SAND** Brownish grey silty fine sand, some fine gravel, wet, very dense. Occasional grey limestone fragments encountered. -High fine to medium gravel fraction between about 7.0 and 11.0 ft.		4		SS	41		60		
8											OVA rdg.= 4.0
9				5		SS	81		90		
10											OVA rdg.= 2.0
11				6		SS	137/ 11in		65		
12											OVA.rdg.= 5.0
13		-Becomes grey below about 13.0 ft.		7		SS	100/ 4in				
13.8											
		Borehole terminated at 13.8 ft in silty sand. NOTE: ELEVATION RESURVEYED MARCH 1994.									AUGER REFUSAL AT 13.8 FEET

Gartner Lee Inc.

BOREHOLE LOG	PROJECT: 90-816	BOREHOLE: 2
PHASE II SUBSOIL INVESTIGATION CHEEKTOWAGA, NEW YORK FOR: Leica Inc.		DATE: 22 October 1990 GEOLOGIST TEJ



DEPTH (ft)	STRATIGRAPHIC DESCRIPTION GROUND ELEVATION 659.70	MONITOR DETAILS & NUMBER	SAMPLE NUMBER	INTERVAL	TYPE	N VALUE	% WATER	% REC	% RQD	COMMENTS
0.4	**ASPHALT**									
1.0 1	**SUB-BASE**(inferred) Grey sandy gravel, moist.		1		SS	7		60		
2	**SILTY CLAY TILL** Brown silty clay, some fine gravel, trace fine sand, DTPL, soft to firm.									OVA rdg.= NIL
3	-Becomes red with decreased fine gravel fraction and some orange colored staining below about 3.0 ft.		2		SS	3		40		
4										OVA rdg.= NIL
5.0 5	-Laminated red to brown silty clay, some fine to medium gravel and trace fine sand below about 5.0 ft.		3		SS	16		80		
6										OVA rdg.= 5.0
6.6 7	**SILTY SAND** Brown silty fine sand, wet, compact to dense.		4		SS	23		80		
8.0 8	-Brown fine sand seam, trace fine gravel and silt with trace orange colored staining from about 8.0 to 9.0 ft.									OVA rdg.= 2.0
9.0 9	-Grey below about 9.0 ft. with grey green staining between about 9.0 and 10.5 ft.		5		SS	79		80		
10 10.5										OVA rdg.= 1.0
11 11.3	-Brown silty clay till layer with trace fine sand and gravel from about 10.5 to 11.3 ft. -Becomes gravelly below about 11.3 ft.		6		SS	78		90		
12										OVA rdg.= 1.0
13.0 13										
	Borehole terminated at 13.0 ft in silty sand and gravel. NOTE: ELEVATION RESURVEYED MARCH 1994.									

Gartner Lee Inc.

BOREHOLE LOG

PROJECT: 90-816

BOREHOLE: 3

PHASE II SUBSOIL INVESTIGATION
CHEEKTOWAGA, NEW YORK
FOR: Leica Inc.

DATE: 22 October 1990
GEOLOGIST TEJ

DEPTH (ft)	STRATIGRAPHY	STRATIGRAPHIC DESCRIPTION GROUND ELEVATION 660.39	MONITOR DETAILS & NUMBER	SAMPLE							COMMENTS
				NUMBER	INTERVAL	TYPE	N VALUE	% WATER	% REC	% RQD	
0.4		**ASPHALT**									
1.0 / 1		**SUB-BASE**(inferred) Grey sandy gravel, moist.		1		SS	27		60		
2		**FILL** Grey to black sand and gravel. trace silty clay, moist, loose to compact.									OVA rdg.= 10.0
3				2		SS	7		40		
4		-Silty clay fraction increases with depth.									OVA rdg.= 10.0
5				3		SS	3		80		
5.7											
6		**SILTY CLAY TILL** Red to brown silty clay, trace fine sand and gravel, APL, soft to firm.									OVA rdg.= 3.0 - 4.0
7				4		SS	7		80		
7.5		-Brown silty sand seam, wet, from about 7.5 to 8.0 ft.									
8.0 / 8											OVA rdg.= 2.0 - 3.0
9				5		SS	6		80		
9.5		**SILTY SAND** Brown silty fine sand, wet, loose.									
10											OVA rdg.= NIL
11				6		SS	153/ 11in		90		
12											OVA rdg.= 1.0
12.9											

Borehole terminated at 12.9 ft in silty sand.

NOTE: ELEVATION RESURVEYED MARCH 1994

BOREHOLE LOG	PROJECT: 90-816	BOREHOLE: 4
PHASE II SUBSOIL INVESTIGATION CHEEKTOWAGA, NEW YORK FOR: - Leica Inc.		DATE: 22 October 1990 GEOLOGIST TEJ

DEPTH (ft)	STRATIGRAPHY	STRATIGRAPHIC DESCRIPTION	MONITOR DETAILS & NUMBER	SAMPLE							COMMENTS
		GROUND ELEVATION 660.51		NUMBER	INTERVAL	TYPE	N VALUE	% WATER	% REC	% RQD	
0.4		**ASPHALT**									
1.0 1		**SUB-BASE**(inferred) Grey sandy gravel, moist.		1		SS	16		25		
2		**FILL** Red brown silty clay, DTPL, stiff. -Becoming a black sand and gravel with some silty clay, compact, below about 2.2 ft.									OVA rdg.= NIL
3.0 3		**SILTY CLAY TILL** Red brown silty clay, some fine gravel, DTPL, very stiff.		2		SS	23		45		
4											OVA rdg.= 10.0
5				3		SS	22		75		
6											OVA rdg.= 6.0
7		-Grey with some fine sand from about 6.7 to 7.0 ft. -Trace sand below about 7.0 ft.		4		SS	18		90		
8.2 8											OVA rdg.= 70.0
9		**SILTY SAND** Brown silty fine sand, wet, compact. Trace orange colored staining between about 9.0 and 10.8 ft.		5		SS	15		80		
10		-Grey below about 10.8 ft.									OVA rdg.= 10.0
11.0 11		**SILTY SAND TILL** Brown silty fine sand, some fine to medium gravel, trace clay, wet, very dense.		6		SS	66		75		
12											OVA rdg.= 1.0
13.0 13		Borehole terminated at 13.0 ft in silty sand till. NOTE: ELEVATION RESURVEYED MARCH 1994.									

Gartner Lee Inc.

BOREHOLE LOG	**PROJECT:** 90-816	**BOREHOLE:** 5
PHASE II SUBSOIL INVESTIGATION CHEEKTOWAGA, NEW YORK FOR: Leica Inc.		**DATE:** 22 October 1990 **GEOLOGIST** TEJ

GROUND ELEVATION 660.32

DEPTH (ft)	STRATIGRAPHIC DESCRIPTION	MONITOR DETAILS & NUMBER	SAMPLE NUMBER	TYPE	N VALUE	% WATER	% REC	% RQD	COMMENTS
0.4	**ASPHALT**								
1.9	**SUB-BASE**(inferred) Grey sand and gravel, trace silty clay, moist.		1	SS	12		70		
3.6	**FILL** Red brown silty clay, some fine to medium gravel, DTPL, stiff. -Becoming grey with trace fine sand and organic staining below about 2.2 ft.		2	SS	21		80		OVA rdg.= 10.0 OVA rdg.=300.0 (bottom of fill)
8.2	**SILTY CLAY TILL** Red brown silty clay; some fine gravel, trace fine sand, DTPL, very stiff. -Weathered from about 3.6 to 5.0 ft. with fractures containing grey alteration.		3 4	SS SS	23 15		85 95		OVA rdg.= 5.0 OVA rdg.= 4.0(silty clay) OVA rdg.= 10.0(silty sand)
9.3 11.3	**SAND and GRAVEL** Brown fine sand and gravel, wet, compact. -4 in. silty fine sand seam at about 8.2 ft. -Becoming fine sand with some gravel below about 9.3 ft.		5 6	SS SS	13 26		85 75		OVA rdg.= NIL
13.0	**SILTY SAND** Brown silty fine sand, trace gravel, wet, compact.								OVA rdg.= 1.0
	Borehole terminated at 13.0 ft in silty sand. NOTE: ELEVATION RESURVEYED MARCH 1994.								

Gartner Lee Inc.

BOREHOLE LOG	PROJECT: 90-816	BOREHOLE: 6
PHASE II SUBSOIL INVESTIGATION CHEEKTOWAGA, NEW YORK FOR: Leica Inc.		DATE: 22 October 1990 GEOLOGIST TEJ

DEPTH (ft)	STRATIGRAPHY	STRATIGRAPHIC DESCRIPTION GROUND ELEVATION 660.18	MONITOR DETAILS & NUMBER	SAMPLE							COMMENTS
				NUMBER	INTERVAL	TYPE	N VALUE	% WATER	% REC	% RQD	
		FILL Brown fine to coarse sand, some silty clay, moist, loose to compact. -7 in. grey sand and gravel layer at surface.		1		SS	13		80		
1											OVA rdg.= NIL
2 2.3				2		SS	8		80		
		SILTY CLAY TILL Red brown silty clay, trace sand and gravel, DTPL, stiff to very stiff. Trace grey alteration between about 2.3 to 3.4 ft.									
3											OVA rdg.=100.0
4		-Weathered from about 4.0 to 6.0 ft. with fractures containing grey alteration.		3		SS	25		100		
5											OVA rdg.= 30.0
6				4		SS	20		100		
7		-Becomes grey with some fine gravel below about 7.1 ft.									OVA rdg.= 10.0
8				5		SS	12		85		
8.7											
9		**SILTY SAND** Brown silty sand, trace fine gravel, wet, loose to compact.									OVA rdg.= 40.0
10				6		SS	2				
11											
12				7		SS	100/1in				
12.6											
		Borehole terminated at 12.6 ft. in silty sand. NOTE: ELEVATION RESURVEYED MARCH 1994.									

BOREHOLE LOG	PROJECT: 90-816	BOREHOLE: 7
PHASE II SUBSOIL INVESTIGATION CHEEKTOWAGA, NEW YORK FOR: Leica Inc.		DATE: 22 October 1990 GEOLOGIST TEJ

DEPTH (ft)	STRATIGRAPHY	STRATIGRAPHIC DESCRIPTION	MONITOR DETAILS & NUMBER	SAMPLE							COMMENTS
		GROUND ELEVATION 660.10		NUMBER	INTERVAL	TYPE	N VALUE	% WATER	% REC	% RQD	
0.4	■	**ASPHALT**									
1.6	⁘	**SUB-BASE** Grey sand and gravel, trace silty clay, moist, loose.		1		SS	7		60		
5.0	▩	**FILL** Brown silty clay, some fine to medium sand, trace fine gravel, firm. -Grey with tar-like substance from about 2.2 to 3.0 ft. -Becomes a black silt and clay with some orange colored staining, some fine gravel and wet below 3.0 ft.		2		SS	5		40		OVA rdg.= 10.0 OVA rdg.= >100.0 STRONG PETROLEUM ODOR OVA rdg.= 80.0
9.0	▨	**SILTY CLAY TILL** Red brown silty clay, some fine gravel, APL, firm to very stiff. -Some black colored staining observed.		3 4		SS SS	6 24		40 70		OVA rdg.= 2.0

Borehole terminated at 9.0 ft. in silty clay till.

NOTE: ELEVATION RESURVEYED MARCH 1994.

Gartner Lee Inc.

BOREHOLE LOG

PROJECT: 90-821

BOREHOLE: 8

PHASE II SUBSOIL INVESTIGATION
CHEEKTOWAGA, NEW YORK
FOR: Leica Inc.

DATE: 19 November 1990
GEOLOGIST TEJ

DEPTH (ft)	STRATIGRAPHIC DESCRIPTION GROUND ELEVATION 654.38	SAMPLE						COMMENTS
		NUMBER	TYPE	N VALUE	% WATER	% REC	% RQD	
0.4	**ASPHALT**							
1.0	**SUB-BASE** Grey sandy gravel.	1	SS	18		71		OVA rdg.= NIL
4.0	**SILTY CLAY TILL** Red brown silty clay, numerous fractures with grey colored alteration, trace fine sand, DTPL, very stiff.							
5.5	**SILTY SAND** Brown silty fine sand, moist, compact to dense.	2	SS	12		83		OVA rdg.= 1
6.4	-Silty clay layer from about 5.5 to 6.4 ft.							
	-Saturated below about 7.0 ft.							
	-Grey brown below about 8.0 ft.							
		3	SS	32		79		OVA rdg.= 1
11.0	Borehole terminated at 11.0 ft in silty sand.							

NOTE: ELEVATION RESURVEYED MARCH 1994.

Gartner Lee Inc.

BOREHOLE LOG

PROJECT: 90-821

BOREHOLE: 9

PHASE II SUBSOIL INVESTIGATION
CHEEKTOWAGA, NEW YORK
FOR: Leica Inc.

DATE: 19 November 1990
GEOLOGIST TEJ

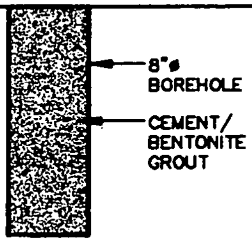
DEPTH (ft)	STRATIGRAPHY	STRATIGRAPHIC DESCRIPTION GROUND ELEVATION 658.91	MONITOR DETAILS & NUMBER	SAMPLE							COMMENTS
				NUMBER	INTERVAL	TYPE	N VALUE	% WATER	% REC	% RQD	
0.4		**ASPHALT**									
1.0 1		**SUB-BASE** Grey sand and gravel.		1		SS	5		63		OVA rdg.= 30
2 3.0 3		**FILL** Black sand and gravel with orange colored staining, moist, loose. -Becoming a grey silty clay with some black colored staining below about 2.2 ft.									
4 5.0 5		**SILTY CLAY TILL** Brown silty clay, trace fine sand and gravel, APL, stiff.		2		SS	11		67		OVA rdg.= 300
		Borehole terminated at 5.0 ft in silty clay till. NOTE: ELEVATION RESURVEYED MARCH 1994.									

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(L-10)

PROJECT NAME: LEICA
PROJECT NO.: 3967
CLIENT: LEICA
LOCATION: CHEEKTOWAGA

HOLE DESIGNATION: BH-E
DATE COMPLETED: JANUARY 23, 1992
DRILLING METHOD: 4 1/4" ID HSA
CRA SUPERVISOR: K. LYNCH

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE	SAMPLE PID (ppm)
	GROUND ELEVATION	656.01					
	Black and gray ASPHALT, some sand and gravel, moist, no odor, FILL	-0.8		1SS	X	26	
2.5	Black SILT, some clay, sand, gravel and brick, moist, no odor No recovery; auger cuttings are moist to wet with some sheen and petroleum odor	-4.0		2SS	/	6	
5.0	Red brown CLAY, some silt, little sand and fine gravel, dry to moist, strong sour odor, NATIVE	-6.0		3SS	X	23	
	END OF HOLE @ 6.0 FT. BGS NOTES: 1. At completion the borehole was backfilled to surface with cement / bentonite grout. 2. No soil samples were collected for chemical analysis.						
7.5							
10.0							
12.5							
15.0							
17.5							
20.0							
22.5							
25.0							
27.5							
30.0							
32.5							

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

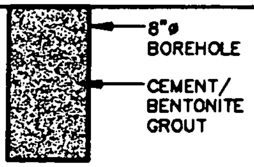
CHEMICAL ANALYSIS ○ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG
(OVERBURDEN)

(L-11)

PROJECT NAME: LEICA
PROJECT NO.: 3967
CLIENT: LEICA
LOCATION: CHEEKTOWAGA

HOLE DESIGNATION: BH-F
DATE COMPLETED: JANUARY 23, 1992
DRILLING METHOD: 4 1/4" ID HSA
CRA SUPERVISOR: K. LYNCH

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	MONITOR INSTALLATION	SAMPLE			
				NUMBER	STATE	'N' VALUE	HNu (ppm)
	GROUND ELEVATION	656.04					
	Black and gray ASPHALT, some sand and gravel, moist to wet, no odor, FILL	-0.6		1SS	☒	19	
2.5	Dark gray SILT, some gravel, little brick, sand and clay, moist to wet, no odor Same, with no brick, wet, no odor	-2.7		2SS	☒	9	
	Red brown SILT, some clay, little sand and gravel, dry to moist, no odor, NATIVE	-4.0					
5.0	END OF HOLE @ 4.0 FT. BGS NOTES: 1. At completion the borehole was backfilled to surface with cement / bentonite grout.						
7.5	2. No soil samples were collected for chemical analysis.						
10.0							
12.5							
15.0							
17.5							
20.0							
22.5							
25.0							
27.5							
30.0							
32.5							

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

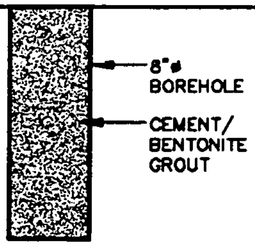
CHEMICAL ANALYSIS ○ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG
(OVERBURDEN)

(L-12)

PROJECT NAME: LEICA
PROJECT NO.: 3967
CLIENT: LEICA
LOCATION: CHEEKTOWAGA

HOLE DESIGNATION: BH-G
DATE COMPLETED: JANUARY 24, 1992
DRILLING METHOD: 4 1/4" ID HSA
CRA SUPERVISOR: K. LYNCH

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE	SAMPLE PID (ppm)
	GROUND ELEVATION	657.25					
	Black and gray ASPHALT, some sand and gravel dry to moist, FILL	-0.8		1SS	☒	20	13.7
2.5	Black and green SILT, some cinders, trace brick and gravel, dry to moist, petroleum odor			2SS	☒	10	8.7
	Same, except black, some clay and gravel, trace roots, sheen, petroleum odor	-4.3					
5.0	Brown SAND, little silt, moist, some petroleum odor, NATIVE	-4.8		3SS	☒	9	14.8 420 58
	Red brown SILT, some clay, little sand and gravel, dry to moist	-6.0					
7.5	END OF HOLE @ 6.0 FT. BGS						
	NOTES:						
	1. At completion the borehole was backfilled to surface with cement / bentonite grout.						
10.0	2. Soil samples collected for chemical analysis of TCL/TAL parameters and TPH from 4.0 to 6.0 ft BGS.						
12.5							
15.0							
17.5							
20.0							
22.5							
25.0							
27.5							
30.0							
32.5							

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS ○ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG
(OVERBURDEN)

(L-13)

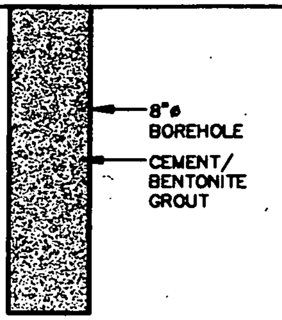
PROJECT NAME: LEICA
PROJECT NO.: 3967
CLIENT: LEICA
LOCATION: CHEEKTOWAGA

HOLE DESIGNATION: BH-H
DATE COMPLETED: JANUARY 24, 1992
DRILLING METHOD: 4 1/4" ID HSA
CRA SUPERVISOR: K. LYNCH

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL
	GROUND ELEVATION	657.77
	Black and gray ASPHALT, some sand and gravel, FILL	-0.6
	White and green pasty material, moist	-0.8
2.5	Black SILT, some cinders and brick, trace gravel, red and green mottling, dry to moist	-3.1
	Same, with some white pasty material, moist	-4.0
5.0	Red brown SILT, some sand and clay, dry to moist, slight odor	-4.7
	Same, except black, some clay, little sand, moist	-5.8
7.5	Red brown SAND, some silt, moist, some gasoline odor	-8.0
	Brown and gray SAND, little silt, trace gravel, moist to wet, some gasoline odor, NATIVE	
10.0	Red brown SILT, some clay, little sand and gravel, dry to moist, no odor	
12.5	END OF HOLE @ 8.0 FT. BGS	
15.0		
17.5		
20.0		
22.5		
25.0		
27.5		
30.0		
32.5		

NOTES:
1. At completion the borehole was backfilled to surface with cement / bentonite grout.
2. No soil samples were collected for chemical analysis.

MONITOR INSTALLATION



SAMPLE			
NUMBER	STATE	'N' VALUE	HNu (ppm)
1SS	☒	24	13 58
2SS	☒	15	91 56 19
3SS	☒	7	17
4SS	☒	30	9.5

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

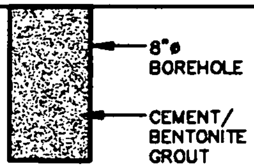
CHEMICAL ANALYSIS ○ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG
(OVERBURDEN)

(L-14)

PROJECT NAME: LEICA
PROJECT NO.: 3967
CLIENT: LEICA
LOCATION: CHEEKTOWAGA

HOLE DESIGNATION: BH-I
DATE COMPLETED: JANUARY 24, 1992
DRILLING METHOD: 4 1/4" ID HSA
CRA SUPERVISOR: K. LYNCH

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE	SAMPLE HNU (ppm)
	GROUND ELEVATION	657.87					
	Black and gray ASPHALT, some sand and gravel, dry to moist, no odor, FILL	-0.6		1SS	☒	24	2
2.5	Red brown SILT, some clay, little sand and gravel, dry to moist			2SS	☒	9	0
	Same, with some brick, black discoloration, dry to moist, no odor						
	Same, except red brown and gray, some sand, little clay and gravel, no brick or discoloration	-3.7					
5.0	Black GRAVEL, some silt, wet, no odor	-3.9					
	Red brown SILT, some clay, little sand, soft, moist, NATIVE	-4.0					
7.5	END OF HOLE @ 4.0 FT. BGS						
	NOTES: 1. At completion the borehole was backfilled to surface with cement / bentonite grout. 2. No soil samples were collected for chemical analysis.						
10.0							
12.5							
15.0							
17.5							
20.0							
22.5							
25.0							
27.5							
30.0							
32.5							

<u>NOTES:</u> MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS ○ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG
(OVERBURDEN)

(L-15)

PROJECT NAME: LEICA INC. R1/FS

PROJECT NO.: 3967

CLIENT: LEICA INC.

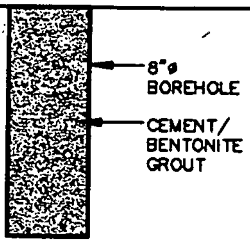
LOCATION: CHEEKTOWAGA, NEW YORK

HOLE DESIGNATION: BH-J

DATE COMPLETED: JANUARY 24, 1992

DRILLING METHOD: 4 1/4" ID HSA

CRA SUPERVISOR: K. LYNCH



DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE	SAMPLE HNu (ppm)
	GROUND SURFACE	658.2					
	ASPHALT	657.9					
	Gray SAND, some asphalt, little gravel, trace brick and clay, dry to moist, slight odor, FILL	656.2		1SS	☒	19	
2.5	Gray and red brown SILT, some clay, trace gravel and brick, moist			2SS	☒	4	
	Same, except black, little clay, no gravel or brick, petroleum odor						
5.0	Same, with some sand, petroleum odor	653.3		3SS	☒	13	
	Red brown SILT, some sand and clay, little gravel, dry to moist, NATIVE	652.2					
7.5	END OF HOLE @ 6.0 FT. BGS NOTES: 1. At completion the borehole was backfilled to surface with cement / bentonite grout.						
10.0	2. No soil samples were collected for chemical analysis.						
12.5							
15.0							
17.5							
20.0							
22.5							
25.0							
27.5							
30.0							
32.5							

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

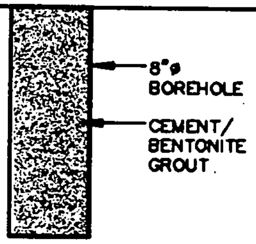
CHEMICAL ANALYSIS ○ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG
(OVERBURDEN)

(L-27)

PROJECT NAME: LEICA INC. RI/FS
PROJECT NO.: 3967
CLIENT: LEICA INC.
LOCATION: CHEEKTOWAGA, NEW YORK

HOLE DESIGNATION: BH-K
DATE COMPLETED: JANUARY 24, 1992
DRILLING METHOD: 4 1/4" ID HSA
CRA SUPERVISOR: K. LYNCH

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	MONITOR INSTALLATION	SAMPLE			
				NUMBER	STATE	'N' VALUE	HNu (ppm)
	GROUND SURFACE	657.4					
	Black and brown ASPHALT, some sand and gravel, dry, no odor, FILL	656.3		1SS	☒	18	0
2.5	Black CINDERS, some coal, bottom ash and clinkers, dry to moist, slight aromatic odor			2SS	☒	3	16.5 15.6
	Same, except moist to wet, petroleum odor	654.0					
	Black and dark gray SILT, some fine sand, little clay, moist, some petroleum odor, NATIVE	653.4 653.0					114
5.0	Brown CLAY, some silt, little sand, soft, moist, slight musty odor	652.2		3SS	☒	6	14 9
	Brown medium to coarse SAND, some silt and clay, moist, soft, plastic, slight odor	651.4					
7.5	Red brown SILT, some clay, trace sand, stiff dry						
	END OF HOLE ⊕ 6.0 FT. BGS						
10.0	NOTES: 1. At completion the boreole was backfilled to surface with cement / bentonite grout. 2. No soil samples were collected for chemical analysis.						
12.5							
15.0							
17.5							
20.0							
22.5							
25.0							
27.5							
30.0							
32.5							

<u>NOTES:</u> MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS ⬭ WATER FOUND ▽ STATIC WATER LEVEL ▼

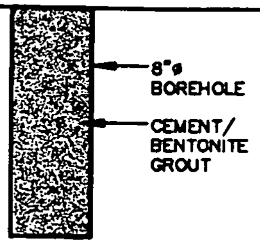
STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(L-28)

PROJECT NAME: LEICA INC. RI/FS
PROJECT NO.: 3967
CLIENT: LEICA INC.
LOCATION: CHEEKTOWAGA, NEW YORK

HOLE DESIGNATION: BH-L
DATE COMPLETED: JANUARY 24, 1992
DRILLING METHOD: 4 1/4" ID HSA
CRA SUPERVISOR: K. LYNCH

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE	SAMPLE HNu (ppm)
	GROUND SURFACE	658.8					
	Black and brown SAND, some gravel and asphalt, FILL	657.4		1SS	☒	54	1.6
2.5	Black CINDERS, some bottom ash, clinkers and coal, moist, slight odor	656.8					
	Black fine to medium SAND, some cinders, dry to moist, some odor	654.5		2SS	☒	9	9.3
5.0	Same, except moist to wet, sheen, petroleum odor	654.1		3SS	☒	12	5.1 29.9 14.3
	Brown SAND, some silt and clay, moist, some odor, moist, NATIVE	652.8					
7.5	Red brown SILT, some clay, little sand, dry to moist, little odor						
	END OF HOLE @ 6.0 FT. BGS NOTES: 1. At completion the boreole was backfilled to surface with cement / bentonite grout. 2. No soil samples were collected for chemical analysis.						
10.0							
12.5							
15.0							
17.5							
20.0							
22.5							
25.0							
27.5							
30.0							
32.5							



NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

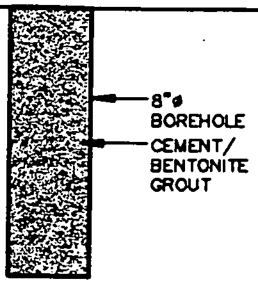
CHEMICAL ANALYSIS ○ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(L-16)

PROJECT NAME: LEICA INC. R1/FS
PROJECT NO.: 3967
CLIENT: LEICA INC.
LOCATION: CHEEKTOWAGA, NEW YORK

HOLE DESIGNATION: BH-M
DATE COMPLETED: JANUARY 27, 1992
DRILLING METHOD: 4 1/4" ID HSA
CRA SUPERVISOR: K. LYNCH



DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE	SAMPLE HNu (ppm)
	GROUND SURFACE	659.9					
	Black and brown ASPHALT, some sand and gravel, FILL	658.9					
2.5	Black CINDERS, little clinkers, gravel and glass, dry to moist	657.3	8"ø BOREHOLE	1SS	☒	15	0 22 51
	Black SILT, little clay, moist, slight odor Same, with some red and gray pasty material, slight odor	655.6	CEMENT/ BENTONITE GROUT	2SS	☒	6	15.7 10
5.0	Brown SILT, some sand, moist, slight odor, NATIVE Same, except red brown, some clay, little sand, dry to moist, slight odor			3SS	☒	19	6.7
7.5	Same, with trace gravel, slight odor	652.9					
	END OF HOLE @ 7.0 FT. BGS NOTES: 1. At completion the borehole was backfilled to surface with cement / bentonite grout. 2. No soil samples were collected for chemical analysis.						
10.0							
12.5							
15.0							
17.5							
20.0							
22.5							
25.0							
27.5							
30.0							
32.5							

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

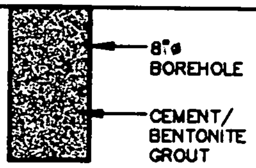
CHEMICAL ANALYSIS ○ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG
(OVERBURDEN)

(L-17)

PROJECT NAME: LEICA INC. R1/FS
PROJECT NO.: 3967
CLIENT: LEICA INC.
LOCATION: CHEEKTOWAGA, NEW YORK

HOLE DESIGNATION: BH-N
DATE COMPLETED: JANUARY 27, 1992
DRILLING METHOD: 4 1/4" ID HSA
CRA SUPERVISOR: K. LYNCH

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	MONITOR INSTALLATION	SAMPLE			
				NUMBER	STATE	'N' VALUE	HNU (ppm)
	GROUND SURFACE	661.4					
	Black and gray ASPHALT, some sand and gravel, dry to moist	660.7		1SS	☒	16	0
2.5	Black and red brown SILT, some sand, gravel and clay, trace cinders, dry to moist, no odor	659.6					
	Brown fine to medium SAND, little silt, moist, no odor	658.6		2SS	☒	5	0
5.0	Red brown CLAY, some silt, little sand and gravel, dry to moist, no odor, NATIVE	657.4					
	END OF HOLE @ 4.0 FT. BGS						
7.5	NOTES: 1. At completion the borehole was backfilled to surface with cement / bentonite grout. 2. Soil sample submitted for chemical analysis from 0.5 to 1.5 ft BGS for TPH.						
10.0							
12.5							
15.0							
17.5							
20.0							
22.5							
25.0							
27.5							
30.0							
32.5							

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

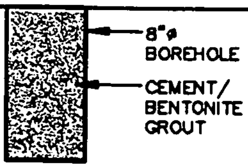
CHEMICAL ANALYSIS ○ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG
(OVERBURDEN)

(L-18)

PROJECT NAME: LEICA INC. R1/FS
PROJECT NO.: 3967
CLIENT: LEICA INC.
LOCATION: CHEEKTOWAGA, NEW YORK

HOLE DESIGNATION: BH-O
DATE COMPLETED: JANUARY 27, 1992
DRILLING METHOD: 4 1/4" ID HSA
CRA SUPERVISOR: K. LYNCH

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	MONITOR INSTALLATION	SAMPLE			
				NUMBER	STATE	'N' VALUE	HNU (ppm)
	GROUND SURFACE	662.0					
	Black and gray ASPHALT, some sand and gravel, dry to moist, FILL	661.5	 	1SS	☒	24	0
	Black COAL, dry	661.0					
2.5	Red brown SILT, some sand and clay, little gravel and glass, dry to moist, no odor	660.0		2SS	☒	8	0
	Red brown SILT, some clay, little sand, trace gravel, dry to moist, no odor, NATIVE	658.7					
5.0	Red CLAY, some silt, little sand, dry to moist, no odor	658.0					
7.5	END OF HOLE @ 4.0 FT. BGS NOTES: 1. At completion the borehole was backfilled to surface with cement / bentonite grout. 2. No soil samples were collected for chemical analysis.						
10.0							
12.5							
15.0							
17.5							
20.0							
22.5							
25.0							
27.5							
30.0							
32.5							

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS ○ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(L-19)

PROJECT NAME: LEICA INC. R1/FS
PROJECT NO.: 3967
CLIENT: LEICA INC.
LOCATION: CHEEKTOWAGA, NEW YORK

HOLE DESIGNATION: BH-P
DATE COMPLETED: JANUARY 27, 1992
DRILLING METHOD: 4 1/4" ID HSA
CRA SUPERVISOR: K. LYNCH

DEPTH ft BGS: 2.5, 5.0, 7.5, 10.0, 12.5, 15.0, 17.5, 20.0, 22.5, 25.0, 27.5, 30.0, 32.5

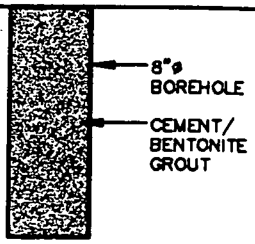
STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL
GROUND SURFACE	660.1
Black and gray ASPHALT, some sand and gravel, dry, FILL	659.6 659.3 658.7
Black COAL, dry, no odor	658.5
Brown ASH, some clinkers, trace coal, dry to moist	658.3
Green and gray SLAG or WEATHERED CONCRETE, dry, no odor	656.6
Light brown SAND, dry, no odor	655.1
Light gray CONCRETE, dry, no odor	654.2
Same, with some brick, vitreous tile and sand, moist to wet; wet below 3.3 ft BGS	654.1
Brown and red brown CLAY, some silt, little fine sand, soft, dry to moist, no odor, NATIVE	
Dark gray SILT, little fine sand, soft, slight odor	
Gray CLAY, soft, dry to moist	

END OF HOLE @ 6.0 FT. BGS

NOTES:

1. At completion the borehole was backfilled to surface with cement / bentonite grout.
2. Soil sample submitted for chemical analysis from 2.0 to 4.0 ft BGS for TPH.

MONITOR INSTALLATION



SAMPLE NUMBER	STATE	'N' VALUE	HNu (ppm)
1SS	☒	35	0
2SS	☒	5	0
3SS	☒	4	0

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

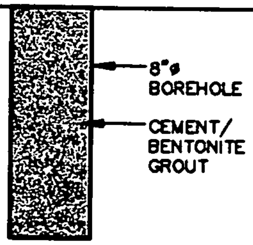
CHEMICAL ANALYSIS ○ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG
(OVERBURDEN)

(L-20)

PROJECT NAME: LEICA INC. R1/FS
PROJECT NO.: 3967
CLIENT: LEICA INC.
LOCATION: CHEEKTOWAGA, NEW YORK

HOLE DESIGNATION: BH-Q
DATE COMPLETED: JANUARY 27, 1992
DRILLING METHOD: 4 1/4" ID HSA
CRA SUPERVISOR: K. LYNCH

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	MONITOR INSTALLATION	SAMPLE			
				NUMBER	STATE	'N' VALUE	HNu (ppm)
	GROUND SURFACE	657.0					
	Black ASPHALT, some sand and gravel, dry to moist, FILL	656.7		1SS	☒	36	31.3
2.5	Red brown SILT, some clay, trace gravel and coal, soft, moist, slight petroleum odor	655.0					
	Black CINDERS, some silt, gravel, coal and clinkers, moist to wet, petroleum odor	654.2 653.3		2SS	☒	2	48.2 42
5.0	Dark gray SILT, little clay and sand, moist, petroleum odor	652.7		3SS	☒	15	196
	Brown SAND, moist, petroleum odor	651.0					
7.5	Same, except moist to wet, some petroleum odor						
	Red brown SILT, some clay, little fine sand and gravel, dry to moist, slight to no odor, NATIVE						
10.0	END OF HOLE @ 6.0 FT. BGS						
12.5	NOTES: 1. At completion the borehole was backfilled to surface with cement / bentonite grout. 2. Soil samples submitted for chemical analysis from 3.0 to 4.0 ft BGS for TPH and from 4.5 to 6.0 ft BGS for TCL/TAL and TPH.						
15.0							
17.5							
20.0							
22.5							
25.0							
27.5							
30.0							
32.5							

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS ○ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(L-21)

PROJECT NAME: LEICA INC. R1/FS

PROJECT NO.: 3967

CLIENT: LEICA INC.

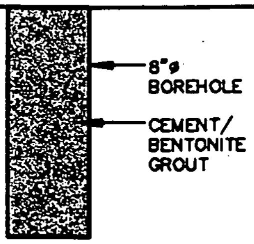
LOCATION: CHEEKTOWAGA, NEW YORK

HOLE DESIGNATION: BH-R

DATE COMPLETED: JANUARY 27, 1992

DRILLING METHOD: 4 1/4" ID HSA

CRA SUPERVISOR: K. LYNCH

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	MONITOR INSTALLATION	SAMPLE			
				NUMBER	STATE	'N' VALUE	HNu (ppm)
	GROUND SURFACE	657.7					
	Black and gray ASPHALT, some sand and gravel, dry to moist, no odor	657.1		1SS	☒	14	0
2.5	Black CINDERS, some clinkers, little coal, moist, no odor	655.7		2SS	☒	4	8.7
	Black to dark gray SILT, little white vitreous tile, moist to wet, petroleum odor	653.7					
5.0	Red brown SILT, some clay, little sand and fine round gravel, dry to moist, no odor, NATIVE			3SS	☒	13	1
	END OF HOLE @ 6.0 FT. BGS NOTES: 1. At completion the borehole was backfilled to surface with cement / bentonite grout. 2. Soil sample submitted for chemical analysis from 2.0 to 4.0 ft BGS for TPH.	651.7					
7.5							
10.0							
12.5							
15.0							
17.5							
20.0							
22.5							
25.0							
27.5							
30.0							
32.5							

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

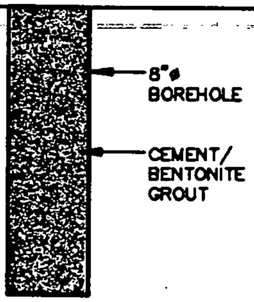
CHEMICAL ANALYSIS ○ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG
(OVERBURDEN)

(L-22)

PROJECT NAME: LEICA INC. R1/FS
PROJECT NO.: 3967
CLIENT: LEICA INC.
LOCATION: CHEEKTOWAGA, NEW YORK

HOLE DESIGNATION: BH-S-1
DATE COMPLETED: JANUARY 30, 1992
DRILLING METHOD: 4 1/4" ID HSA
CRA SUPERVISOR: K. LYNCH

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	MONITOR INSTALLATION	SAMPLE			
				NUMBER	STATE	'N' VALUE	HNu (ppm)
	GROUND SURFACE	659.9					
	Gray GRAVEL some sand and trace asphalt, dry, no odor, FILL			1SS	☒	36	0
2.5	Same, except moist to wet			2SS	☒	5	0
5.0	Same, except brown, trace brick, silt and sand, wet, no odor			3SS	☒	3	0
	Red brown SILT, some clay, trace fine round gravel, dry to moist, no odor, NATIVE	653.5		4SS	☒	24	0
7.5	END OF HOLE @ 7.5 FT. BGS NOTES: 1. At completion the borehole was backfilled to surface with cement / bentonite grout. 2. Sample of bedding material submitted for chemical analysis from 6.0 to 7.0 ft BGS for VOCs and TPH.	652.4					
10.0							
12.5							
15.0							
17.5							
20.0							
22.5							
25.0							
27.5							
30.0							
32.5							

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

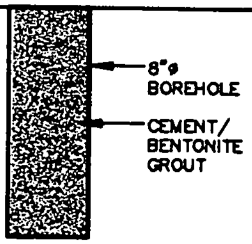
CHEMICAL ANALYSIS ○ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(L-23)

PROJECT NAME: LEICA INC. R1/FS
PROJECT NO.: 3967
CLIENT: LEICA INC.
LOCATION: CHEEKTOWAGA, NEW YORK

HOLE DESIGNATION: BH-S-2
DATE COMPLETED: JANUARY 30, 1992
DRILLING METHOD: 4 1/4" ID HSA
CRA SUPERVISOR: K. LYNCH

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	MONITOR INSTALLATION	SAMPLE			
				NUMBER	STATE	'N' VALUE	HNu (ppm)
	GROUND SURFACE	659.9					
	Gray GRAVEL, some sand, little white brick, little asphalt, dry, no odor, FILL			1SS	☒	23	0
2.5	No recovery	657.9					
	Dark gray SILT, some clay, little brick, trace gravel, wet, petroleum odor			2SS	⧄	5	0
5.0	Red brown SILT, some clay, dry to moist, NATIVE	654.9		3SS	☒	13	0
	END OF HOLE @ 6.0 FT. BGS	653.9					
7.5	NOTES: 1. At completion the borehole was backfilled to surface with cement / bentonite grout. 2. Insufficient volume of bedding material recovered for chemical sample.						
10.0							
12.5							
15.0							
17.5							
20.0							
22.5							
25.0							
27.5							
30.0							
32.5							

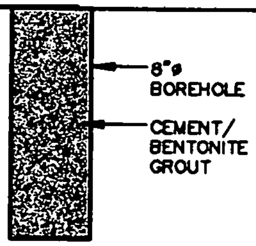
NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS ○ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG
(OVERBURDEN)

PROJECT NAME: LEICA INC. R1/FS
PROJECT NO.: 3967
CLIENT: LEICA INC.
LOCATION: CHEEKTOWAGA, NEW YORK

HOLE DESIGNATION: BH-S-3
DATE COMPLETED: JANUARY 30, 1992
DRILLING METHOD: 4 1/4" ID HSA
CRA SUPERVISOR: K. LYNCH

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	MONITOR INSTALLATION	SAMPLE			
				NUMBER	STATE	'N' VALUE	HNu (ppm)
	GROUND SURFACE	656.3					
	Gray and brown GRAVEL, some sand, dry to moist	654.7		1SS	☒	27	0
2.5	Dark gray CINDERS, some brick, coal and clinkers, little wood, moist to wet, slight petroluem odor	654.3		2SS	☒	6	0
	Dark gray GRAVEL, some glass and brick, moist to wet	653.7					
5.0	Black CINDERS, some fibrous material, moist to wet, strong odor	653.2		3SS	☒	19	0
7.5	Gray and brown mottled SILT, some clay and fine sand, moist	652.5					
	Red brown SILT, some clay, hard, dense, dry to moist, NATIVE	652.3					
10.0	Brown and red brown SAND, some gravel and clay, moist to wet, slight odor	651.5					
	Red brown SILT, some clay, little fine gravel, dry to moist, no odor	650.3					
12.5	END OF HOLE @ 6.0 FT. BGS						
15.0							
17.5							
20.0							
22.5							
25.0							
27.5							
30.0							
32.5							

NOTES:
1. At completion the borehole was backfilled to surface with cement / bentonite grout.
2. No soil samples were collected for chemical analysis as soil from interval corresponding to sewer invert is not bedding material.

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

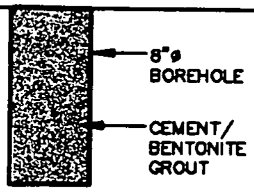
CHEMICAL ANALYSIS ⬭ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG
(OVERBURDEN)

(L-25)

PROJECT NAME: LEICA INC. R1/FS
PROJECT NO.: 3967
CLIENT: LEICA INC.
LOCATION: CHEEKTOWAGA, NEW YORK

HOLE DESIGNATION: BH-S-4
DATE COMPLETED: JANUARY 30, 1992
DRILLING METHOD: 4 1/4" ID HSA
CRA SUPERVISOR: K. LYNCH

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	MONITOR INSTALLATION	SAMPLE			
				NUMBER	STATE	'N' VALUE	HNU (ppm)
	GROUND SURFACE	656.4					
	Gray GRAVEL, some sand, little brick and glass, dry to moist, no odor No recovery		 8"φ BOREHOLE CEMENT/ BENTONITE GROUT	1SS		27	
2.5				2SS		11	
	Dark gray coarse SAND, some gravel, wet, sheen, slight petroleum odor			3SS		2/1"	
5.0	END OF HOLE @ 4.6 FT. BGS NOTES: 1. Borehole was abandoned because of concerns that if the sewer pipe was hit and broken the groundwater in the pipe trench would be introduced into the flow stream of the sewer. 2. At completion the borehole was backfilled to surface with cement / bentonite grout. 3. No soil samples were collected for chemical analysis due to low soil recoveries.	651.8					
7.5							
10.0							
12.5							
15.0							
17.5							
20.0							
22.5							
25.0							
27.5							
30.0							
32.5							

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

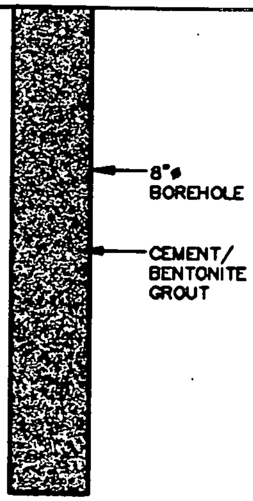
CHEMICAL ANALYSIS ○ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG
(OVERBURDEN)

(L-26)

PROJECT NAME: LEICA INC. R1/FS
PROJECT NO.: 3967
CLIENT: LEICA INC.
LOCATION: CHEEKTOWAGA, NEW YORK

HOLE DESIGNATION: BH-S-DEEP
DATE COMPLETED: JANUARY 30, 1992
DRILLING METHOD: 4 1/4" ID HSA
CRA SUPERVISOR: K. LYNCH

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	MONITOR INSTALLATION	SAMPLE			
				NUMBER	STATE	'N' VALUE	HNu (ppm)
	GROUND SURFACE	*655.0*					
	Auger only to 8.0 ft BGS						
2.5							
5.0							
7.5		*647.0*					
	Red brown with gray SILT, some clay and sand in interbedded lenses, dry to moist	*646.2*		1SS	☒	13	
10.0	Gray CLAY, little silt, stiff, moist Same, except soft	*645.1*		2SS	☒	13	
12.5	Gray SAND, trace silt, moist to wet, no odor Same, with some fine to medium sand in pockets, little fine round gravel, moist to wet Same, with some gravel, wet, possible NAPL, some odor	*642.3*		3SS	☒	>50	
	END OF HOLE @ 12.7 FT. BGS NOTES: 1. At completion the borehole was backfilled to surface with cement / bentonite grout. 2. Soil sample collected for chemical analysis from 11.0 to 12.5 ft BGS. for VOCs and TPH.						
15.0							
17.5							
20.0							
22.5							
25.0							
27.5							
30.0							
32.5							

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

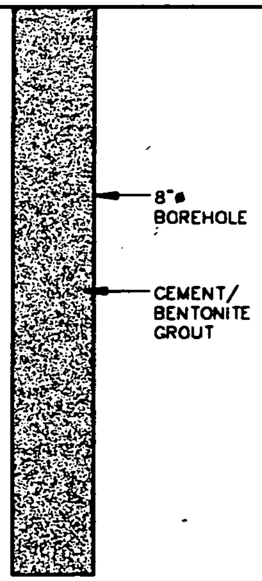
CHEMICAL ANALYSIS ○ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG
(OVERBURDEN)

(L-04)

PROJECT NAME: LEICA
PROJECT NO.: 3967
CLIENT: LEICA
LOCATION: CHEEKTOWAGA, N.Y.

HOLE DESIGNATION: BH-7A
DATE COMPLETED: JULY 2, 1991
DRILLING METHOD: 4 1/4" ID HSA
CRA SUPERVISOR: K. LYNCH

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	MONITOR INSTALLATION	SAMPLE			
				NUMBER	STATE	'N' VALUE	HNu (ppm)
	GROUND ELEVATION	658.41					
	Augered through asphalt to 0.5 ft BGS	-0.5					
	Dark brown to black CLAY, some silt, little gravel and fine sand, trace white brick, moist, FILL	-1.9 -2.0		1SS	☒	16	1.8
2.5	Black coarse SAND, some brick, moist to wet, fuel oil odor			2SS	☒	6	1.4
5.0	Black SILT, little fine sand and clay, moist to wet, fuel oil odor, sheen	-4.5		3SS	☒	10	1.6
	Red brown SILT, some clay, little fine rounded gravel, dry to moist, no odor, NATIVE	-6.7		4SS	☒	31	0.6
7.5	Red brown CLAY, some silt, little fine sand and fine round gravel, dry to moist	-9.0		5SS	☒	24	0.8
10.0	Brown medium SAND, little silt and fine round gravel, moist, slight fuel oil odor Gray to light brown SAND, very wet Same, except brown and gray			6SS	☒	54	1.5
12.5				7SS	☒	26	1
15.0	Gray fine to medium SAND, some fine to medium round gravel, hard, dense, moist	-14.9		8SS	☒	>100	1.6
17.5	END OF HOLE @ 14.9 FT. BGS NOTES: 1. At completion this borehole was grouted to ground surface due to the observed presence of fuel oil in the borehole soils. 2. No soil samples were taken for chemical analysis. Geologic record samples were collected.						
20.0							
22.5							
25.0							
27.5							
30.0							
32.5							

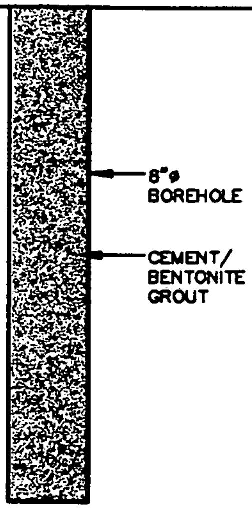
NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

GRAIN SIZE ANALYSIS ⬭ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG
(OVERBURDEN)

(L-29)

PROJECT NAME: LEICA INC. RI/FS
PROJECT NO.: 3967
CLIENT: LEICA INC.
LOCATION: CHEEKTOWAGA, NEW YORK
HOLE DESIGNATION: BH-EDW1-93
DATE COMPLETED: DECEMBER 14, 1993
DRILLING METHOD: 4 1/4" ID HSA
CRA SUPERVISOR: K. LYNCH

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	MONITOR INSTALLATION	SAMPLE			
				NUMBER	STATE	'N' VALUE	PID (ppm)
	GROUND SURFACE	660.3					
	Augered through asphalt pavement	659.8					
	SP-SAND(FILL), some gravel and cement, brown, moist to wet	658.5		1SS	☒	62	
2.5	ML-SILT(NATIVE), some clay, trace fine rounded gravel, very stiff, laminated, red brown and gray, slight odor increasing with depth			2SS	☒	29	
5.0				3SS	☒	24	
7.5	SM-SAND, some silt, trace to little fine rounded gravel, moist to wet, strong odor	653.3		4SS	☒	23	
				5SS	☒		
10.0				6SS	☒	94	
12.5	SM-SAND(TILL), some silt, little subrounded gravel, very stiff, brown and gray, dry to moist, slight odor	647.9 647.4		7SS	☒	>100	
15.0	END OF HOLE @ 12.9 FT. BGS NOTES: 1. Soil sample collected from 8.0 to 11.0 ft BGS for chemical analysis of TCL VOCs, TCL BNAs, TAL Metals, and TPH. 2. Borehole backfilled with cement/bentonite grout to surface 3. PID fault; instrument checked, lamp changed – still inoperative.						
17.5							
20.0							
22.5							
25.0							
27.5							
30.0							
32.5							

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS ○ WATER FOUND ▽ STATIC WATER LEVEL ▼

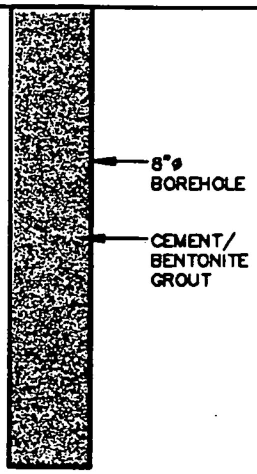
STRATIGRAPHIC AND INSTRUMENTATION LOG
(OVERBURDEN)

(L-30)

PROJECT NAME: LEICA INC. RI/FS
PROJECT NO.: 3967
CLIENT: LEICA INC.
LOCATION: CHEEKTOWAGA, NEW YORK

HOLE DESIGNATION: BH-EDW-SE
DATE COMPLETED: JANUARY 17, 1994
DRILLING METHOD: 4 1/4" ID HSA
CRA SUPERVISOR: K. LYNCH

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	MONITOR INSTALLATION	SAMPLE			
				NUMBER	STATE	'N' VALUE	PID (ppm)
	GROUND SURFACE	660.7					
2.5 5.0	Augered to 6.0 ft BGS						
7.5	ML–SILT(NATIVE), some clay and sand, very stiff, laminated, red brown, dry to moist, no odor or sheen	654.7		1SS	☒	22	
10.0	SW–SAND, gray, moist to wet, no odor or sheen	652.2		2SS 3SS	☒ ☒	13 44	
12.5 15.0 17.5 20.0 22.5 25.0 27.5 30.0 32.5	END OF HOLE @ 12.0 FT. BGS NOTES: 1. Soil samples retained for geologic record. 2. Borehole backfilled with cement/bentonite grout to surface 3. PID fault due due to cold weather/heavy snow.	648.7					



NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

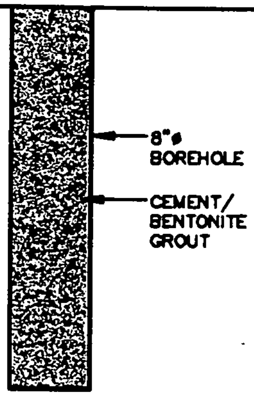
CHEMICAL ANALYSIS ○ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG
(OVERBURDEN)

(L-31)

PROJECT NAME: LEICA INC. RI/FS
PROJECT NO.: 3967
CLIENT: LEICA INC.
LOCATION: CHEEKTOWAGA, NEW YORK

HOLE DESIGNATION: BH-EDW-NE
DATE COMPLETED: JANUARY 17, 1994
DRILLING METHOD: 4 1/4" ID HSA
CRA SUPERVISOR: K. LYNCH

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	MONITOR INSTALLATION	SAMPLE			
				NUMBER	STATE	'N' VALUE	PID (ppm)
	GROUND SURFACE	659.4					
	Augered to 6.0 ft BGS						
2.5							
5.0							
	CL-CLAY(NATIVE), some silt, red brown, dry to moist	653.4					
7.5	SW-SAND, trace silt, brown to gray, moist to wet, no sheen or odor	653.3		1SS	☒	8	
				2SS	☒	25	
10.0	END OF HOLE @ 10.0 FT. BGS NOTES: 1. Soil samples retained for geologic record. 2. Borehole backfilled with cement/bentonite grout to surface 3. PID fault due due to cold weather/heavy snow.	649.4					
12.5							
15.0							
17.5							
20.0							
22.5							
25.0							
27.5							
30.0							
32.5							

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

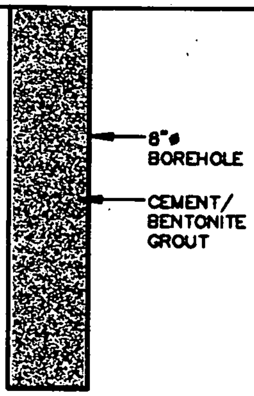
CHEMICAL ANALYSIS ○ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG
(OVERBURDEN)

(L-32)

PROJECT NAME: LEICA INC. R1/FS
PROJECT NO.: 3967
CLIENT: LEICA INC.
LOCATION: CHEEKTOWAGA, NEW YORK

HOLE DESIGNATION: BH-EDW-N
DATE COMPLETED: JANUARY 17, 1994
DRILLING METHOD: 4 1/4" ID HSA
CRA SUPERVISOR: K. LYNCH

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	MONITOR INSTALLATION	SAMPLE			
				NUMBER	STATE	'N' VALUE	PID (ppm)
	GROUND SURFACE	660.8					
	Augered to 6.0 ft BGS						
2.5							
5.0							
	SM—SAND, little silt and clay, trace gravel, brown with gray, moist to wet, no sheen — slight to moderate odor (below 8.0 ft BGS)	654.8					
7.5				1SS	☒	20	
				2SS	☒	69	
10.0	END OF HOLE @ 10.0 FT. BGS NOTES: 1. Soil samples retained for geologic record. 2. Borehole backfilled with cement/bentonite grout to surface 3. PID fault due due to cold weather/heavy snow.	650.8					
12.5							
15.0							
17.5							
20.0							
22.5							
25.0							
27.5							
30.0							
32.5							

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

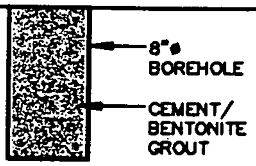
CHEMICAL ANALYSIS ○ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG
(OVERBURDEN)

(L-33)

PROJECT NAME: LEICA INC. RI/FS
PROJECT NO.: 3967
CLIENT: LEICA INC.
LOCATION: CHEEKTOWAGA, NEW YORK

HOLE DESIGNATION: BH-T1-93
DATE COMPLETED: DECEMBER 14, 1993
DRILLING METHOD: 4 1/4" ID HSA
CRA SUPERVISOR: K. LYNCH

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	MONITOR INSTALLATION	SAMPLE			
				NUMBER	STATE	'N' VALUE	PID (ppm)
	GROUND SURFACE	659.2					
	Augered through asphalt	658.7					
	SP-SAND(FILL), little gravel and silt, trace deteriorated concrete, dark brown, moist, slight petroleum odor	657.8		1SS	☒	7	NA
2.5							
	ML-SILT(NATIVE), little clay and fine sand, trace gravel, red brown, dry, no odor	655.2		2SS	☒	26	NA
5.0	END OF HOLE @ 4.0 FT. BGS NOTES: 1. Soil sample collected 0.5 to 1.5 ft BGS for chemical analysis of TCL VOCs and TPH. 2. Borehole backfilled with cement/bentonite grout to surface.						
7.5							
10.0							
12.5							
15.0							
17.5							
20.0							
22.5							
25.0							
27.5							
30.0							
32.5							

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

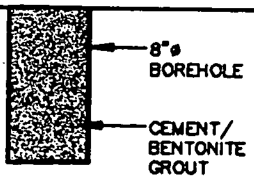
CHEMICAL ANALYSIS ○ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG
(OVERBURDEN)

(L-34)

PROJECT NAME: LEICA INC. RI/FS
PROJECT NO.: 3967
CLIENT: LEICA INC.
LOCATION: CHEEKTOWAGA, NEW YORK

HOLE DESIGNATION: BH-T2-93
DATE COMPLETED: DECEMBER 14, 1993
DRILLING METHOD: 4 1/4" ID HSA
CRA SUPERVISOR: K. LYNCH

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	MONITOR INSTALLATION	SAMPLE			
				NUMBER	STATE	'N' VALUE	PID (ppm)
	GROUND SURFACE	659.3					
	SP-SAND(FILL), some gravel, black and gray, moist to wet, no odor, no sheen			1SS	☒	35	NA
2.5		656.7					
	ML-SILT(NATIVE), some clay, little sand and fine rounded gravel, stratified, red brown, dry to moist, no sheen, no odor	655.3		2SS	☒	21	NA
5.0	END OF HOLE @ 4.0 FT. BGS NOTES: 1. Soil sample collected 0.0 to 2.0 ft BGS for chemical analysis of TCL VOCs and TPH. 2. Borehole backfilled with cement/bentonite grout to surface.						
7.5							
10.0							
12.5							
15.0							
17.5							
20.0							
22.5							
25.0							
27.5							
30.0							
32.5							

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

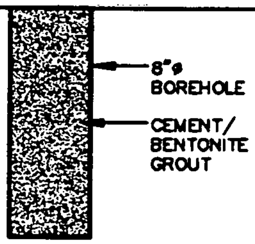
CHEMICAL ANALYSIS ○ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG
(OVERBURDEN)

(L-35)

PROJECT NAME: LEICA INC. RI/FS
PROJECT NO.: 3967
CLIENT: LEICA INC.
LOCATION: CHEEKTOWAGA, NEW YORK

HOLE DESIGNATION: BH-T3-93
DATE COMPLETED: DECEMBER 14, 1993
DRILLING METHOD: 4 1/4" ID HSA
CRA SUPERVISOR: K. LYNCH

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	MONITOR INSTALLATION	SAMPLE			
				NUMBER	STATE	'N' VALUE	PID (ppm)
	GROUND SURFACE	*659.8*					
	Augered through asphalt and pavement			1SS	☒	20	NA
2.5	– cement, deteriorated, trace sand and gravel, dry to moist	*657.1*		2SS	☒	10	NA
	ML–SILT(NATIVE), little sand and clay, dark gray, moist						
5.0	– some sand, little clay, trace rounded gravel, red brown			3SS	☒	27	NA
	END OF HOLE @ 6.0 FT. BGS NOTES: 1. Soil sample collected 2.0 to 4.0 ft BGS for chemical analysis of TCL VOCs and TPH. 2. Borehole backfilled with cement/bentonite grout to surface.	*653.8*					
7.5							
10.0							
12.5							
15.0							
17.5							
20.0							
22.5							
25.0							
27.5							
30.0							
32.5							

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

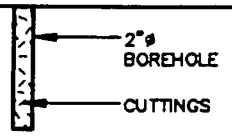
CHEMICAL ANALYSIS ○ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG
(OVERBURDEN)

(L-36)

PROJECT NAME: LEICA INC. RI/FS
PROJECT NO.: 3967
CLIENT: LEICA INC.
LOCATION: CHEEKTOWAGA, NEW YORK

HOLE DESIGNATION: BH-1-93
DATE COMPLETED: DECEMBER 1, 1993
DRILLING METHOD: HAND DRIVER / 2" SPLIT SPOON
CRA SUPERVISOR: K. LYNCH

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	MONITOR INSTALLATION	SAMPLE			
				NUMBER	STATE	'N' VALUE	PID (ppm)
	GROUND SURFACE	655.2					
	OL-SILT(FILL), loam, rotting leaves, rootlets, black, moist, no odor, no sheen	654.4		1SS	☒	5	0.5
2.5	ML-SILT(NATIVE), some sand, trace roots, gray brown, moist, no odor, no sheen – some clay, little sand, stiff, red brown, dry to moist, no odor, no sheen	652.0		2SS	☒	>40	0
5.0	END OF HOLE @ 3.2 FT. BGS NOTES: 1. Soil sample collected form 0.0 to 3.0 ft BGS for chemical analysis of TCL VOCs, TCL BNAs, TAL Metals and TPH. 2. Borehole backfilled with cuttings to surface						
7.5							
10.0							
12.5							
15.0							
17.5							
20.0							
22.5							
25.0							
27.5							
30.0							
32.5							

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

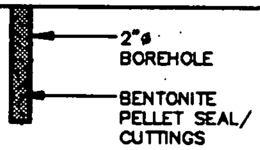
CHEMICAL ANALYSIS ⬭ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG
(OVERBURDEN)

(L-37)

PROJECT NAME: LEICA INC. RI/FS
PROJECT NO.: 3967
CLIENT: LEICA INC.
LOCATION: CHEEKTOWAGA, NEW YORK

HOLE DESIGNATION: BH-2-93
DATE COMPLETED: DECEMBER 8, 1993
DRILLING METHOD: HAND DRIVER / 2" SPLIT SPOON
CRA SUPERVISOR: K. LYNCH

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	MONITOR INSTALLATION	SAMPLE			
				NUMBER	STATE	'N' VALUE	PID (ppm)
	GROUND SURFACE	654.7					
	TOPSOIL(FILL), loamy, loose, black, moist to wet						
	ML–SILT(NATIVE), medium stiff, brown, moist – little sand, little clay, trace fine gravel, stiff to very stiff, laminated, red brown	653.7		1SS	☒	7	0
2.5				2SS	☒	>40	0
	END OF HOLE @ 3.0 FT. BGS NOTES: 1. Soil sample collected from 0.0 to 3.0 ft BGS for chemical analysis of TCL VOCs, TAL Metals and TPH. 2. Borehole backfilled with cuttings and bentonite pellets.	651.7					
5.0							
7.5							
10.0							
12.5							
15.0							
17.5							
20.0							
22.5							
25.0							
27.5							
30.0							
32.5							

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS ○ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG
(OVERBURDEN)

(L-38)

PROJECT NAME: LEICA INC. RI/FS

PROJECT NO.: 3967

CLIENT: LEICA INC.

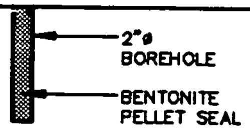
LOCATION: CHEEKTOWAGA, NEW YORK

HOLE DESIGNATION: BH-3-93

DATE COMPLETED: DECEMBER 8, 1993

DRILLING METHOD: HAND DRIVER / 2" SPLIT SPOON

CRA SUPERVISOR: K. LYNCH

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	MONITOR INSTALLATION	SAMPLE			
				NUMBER	STATE	'N' VALUE	PID (ppm)
	GROUND SURFACE	654.0					
	TOPSOIL(FILL), loamy, loose, dark gray to black, moist	653.5		1SS	☒	10	0
2.5	ML-SILT, little gravel, trace brick, soft, brown, moist – little clay, dark gray, dry to moist, odor	651.5 651.0		2SS	☒	>38	34
	ML-SILT(NATIVE), some clay, dense, laminated, red brown, dry to moist, slight odor						
5.0	END OF HOLE @ 3.0 FT. BGS NOTES: 1. Soil sample collected from 1.5 to 3.0 ft BGS for chemical analysis of TCL VOCs, TCL BNAs, TAL Metals, TPH, TOC and 310.13. 2. Borehole backfilled with bentonite pellets						
7.5							
10.0							
12.5							
15.0							
17.5							
20.0							
22.5							
25.0							
27.5							
30.0							
32.5							

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

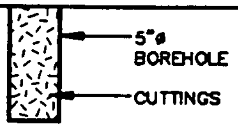
CHEMICAL ANALYSIS ○ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG
(OVERBURDEN)

(L-39)

PROJECT NAME: LEICA INC. R1/FS
PROJECT NO.: 3967
CLIENT: LEICA INC.
LOCATION: CHEEKTOWAGA, NEW YORK

HOLE DESIGNATION: BH-3A-93
DATE COMPLETED: DECEMBER 13, 1993
DRILLING METHOD: HAND AUGERED
CRA SUPERVISOR: K. LYNCH

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	MONITOR INSTALLATION	SAMPLE			
				NUMBER	STATE	'N' VALUE	PID (ppm)
	GROUND SURFACE	654.2					
	TOPSOIL(FILL), loamy, black, moist to wet	653.7	 				
	ML-SILT(FILL), little sand and clay, red brown						
2.5	ML-SILT(NATIVE), little sand and clay, gray	652.2					
	— some clay, stiff, red brown, dry to moist, no odor or sheen	651.2					
	END OF HOLE @ 3.0 FT. BGS						
5.0	NOTES: 1. Location is 20' east of BH-3-93. 2. Soil sample retained for geologic record. 3. Borehole backfilled with cuttings.						
7.5							
10.0							
12.5							
15.0							
17.5							
20.0							
22.5							
25.0							
27.5							
30.0							
32.5							

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

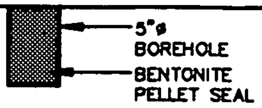
CHEMICAL ANALYSIS ○ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG
(OVERBURDEN)

(L-40)

PROJECT NAME: LEICA INC. RI/FS
PROJECT NO.: 3967
CLIENT: LEICA INC.
LOCATION: CHEEKTOWAGA, NEW YORK

HOLE DESIGNATION: BH-3B-93
DATE COMPLETED: DECEMBER 13, 1993
DRILLING METHOD: HAND AUGERED
CRA SUPERVISOR: K. LYNCH

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE	SAMPLE PID (ppm)
	GROUND SURFACE	654.4					
	TOPSOIL(FILL), loamy, black, moist	654.1					
2.5	ML-SILT(FILL), red and yellow brick, cotton fibres, trace coal, clinkers, gravel, moist to wet, musty odor	652.9					
	ML-SILT(NATIVE), some sand, medium dense, gray, moist to wet, musty odor	652.4					
5.0	END OF HOLE @ 2.0 FT. BGS NOTES: 1. Location is 12' east of BH-3-93. 2. Fill may be from trench for 8" sewer which is very close to borehole location. 3. Water at 1.0 ft BGS at completion. 4. Borehole backfilled with bentonite pellets.						
7.5							
10.0							
12.5							
15.0							
17.5							
20.0							
22.5							
25.0							
27.5							
30.0							
32.5							

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

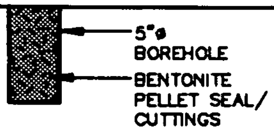
CHEMICAL ANALYSIS ○ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(L-41)

PROJECT NAME: LEICA INC. RI/FS
PROJECT NO.: 3967
CLIENT: LEICA INC.
LOCATION: CHEEKTOWAGA, NEW YORK

HOLE DESIGNATION: BH-3C-93
DATE COMPLETED: DECEMBER 13, 1993
DRILLING METHOD: HAND AUGERED
CRA SUPERVISOR: K. LYNCH

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	MONITOR INSTALLATION	SAMPLE			
				NUMBER	STATE	'N' VALUE	PID (ppm)
	GROUND SURFACE	654.2					
	TOPSOIL(FILL), loamy, dark black, moist to wet	653.7					0
	ML-SILT(FILL), little sand and clay, red brown, moist	652.7					0
2.5	ML-SILT(NATIVE), little clay, medium stiff, red brown and gray, moist	651.7					0
	END OF HOLE @ 2.5 FT. BGS						
5.0	NOTES: 1. Location is 17 feet east of BH-3-93. 2. Soil sample collected from 1.5 to 2.5 ft BGS from analysis of TCL VOCs, TAL Metals, and TPH. 3. Borehole backfilled with bentonite pellets and cuttings.						
7.5							
10.0							
12.5							
15.0							
17.5							
20.0							
22.5							
25.0							
27.5							
30.0							
32.5							

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

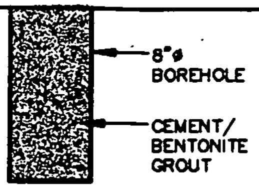
CHEMICAL ANALYSIS ○ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG
(OVERBURDEN)

(L-42)

PROJECT NAME: LEICA INC. R1/FS
PROJECT NO.: 3967
CLIENT: LEICA INC.
LOCATION: CHEEKTOWAGA, NEW YORK

HOLE DESIGNATION: BH-4-93
DATE COMPLETED: DECEMBER 3, 1993
DRILLING METHOD: 4 1/4" ID HSA
CRA SUPERVISOR: K. LYNCH



DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	MONITOR INSTALLATION	SAMPLE			
				NUMBER	STATE	'N' VALUE	PID (ppm)
	GROUND SURFACE	657.2					
	Auger only through asphalt pavement	656.7					
	GM-GRAVEL(FILL), some silt, some sand, brick, glass, gray, moist	655.7		1SS	☒	9	–
2.5	ML-SILT, some sand, trace clinkers and coal, ash, black, moist, stong petroleum odor, red and white streaks throughout sample	653.8		2SS	☒	5	–
5.0	ML-SILT(NATIVE), some sand, trace clay and decayed vegetation, stratified, dark gray to black, moist, moderate petroleum odor – little sand and gravel, red brown, dry to moist, slight petroleum odor	652.7					
7.5	END OF HOLE @ 4.5 FT. BGS NOTES: 1. Soil sample collected 0.5 to 4.5 ft BGS for TCLP analysis of VOCs, BNAs, Metals and 310.13. 2. Borehole backfilled with cement/bentonite grout to surface.						
10.0							
12.5							
15.0							
17.5							
20.0							
22.5							
25.0							
27.5							
30.0							
32.5							

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS ○ WATER FOUND ▽ STATIC WATER LEVEL ▼

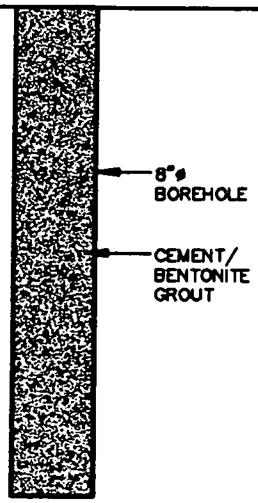
STRATIGRAPHIC AND INSTRUMENTATION LOG
(OVERBURDEN)

(L-43)

PROJECT NAME: LEICA INC. RI/FS
PROJECT NO.: 3967
CLIENT: LEICA INC.
LOCATION: CHEEKTOWAGA, NEW YORK

HOLE DESIGNATION: BH-5-93
DATE COMPLETED: DECEMBER 1, 1993
DRILLING METHOD: 4 1/4" ID HSA
CRA SUPERVISOR: K. LYNCH

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	MONITOR INSTALLATION	SAMPLE			
				NUMBER	STATE	'N' VALUE	PID (ppm)
	GROUND SURFACE	656.5					
	Augered to 8.0 ft BGS						
2.5							
5.0							
7.5							
	ML-SILT(NATIVE), some sand, medium dense, red brown to brown, moist	648.5					
				1SS	☒	12	75
10.0							
				2SS	☒	17	60
	SM-SAND, little silt, trace fine subrounded gravel, moist to wet	644.9					
12.5	– discolored lense, dark, petroleum odor	643.7		3SS	☒	>100	10
	END OF HOLE @ 12.8 FT. BGS NOTES: 1. Location is adjacent to MW-11. See MW-11 for stratigraphy from 0.0 to 8.0 ft BGS. 2. Soil sample collected for chemical analysis from 8.0 to 12.8 ft BGS for TCL and TCLP VOCs, BNAs, Metals, TRPH, TOC and 310.13. 3. Borehole backfilled with cement/bentonite grout to surface.						
15.0							
17.5							
20.0							
22.5							
25.0							
27.5							
30.0							
32.5							



NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS ○ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG
(OVERBURDEN)

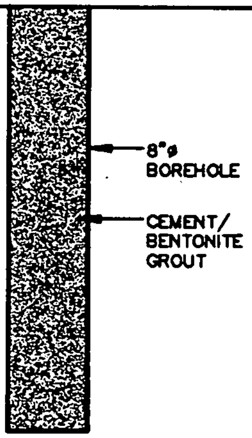
(L-44)

PROJECT NAME: LEICA INC. RI/FS
PROJECT NO.: 3967
CLIENT: LEICA INC.
LOCATION: CHEEKTOWAGA, NEW YORK

HOLE DESIGNATION: BH-6-93
DATE COMPLETED: DECEMBER 1, 1993
DRILLING METHOD: 4 1/4" ID HSA
CRA SUPERVISOR: K. LYNCH

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL
	GROUND SURFACE	656.3
	Auger only through asphalt pavement	655.8
	GP-GRAVEL(FILL), some sand, gray, moist	655.3
2.5	ML-SILT(NATIVE), some sand, little clay, trace gravel, laminated, stiff, red brown, dry to moist	
5.0		
7.5	SM-SAND, little silt, trace to little fine to medium rounded gravel, gray, moist to wet	649.0
10.0		
	END OF HOLE @ 11.1 FT. BGS NOTES: 1. Soil sample collected from 1.0 to 4.0 ft and 8.0 to 11.0 ft BGS for chemical analysis of TCL VOCs, TAL Metals and TPH. 3. Borehole backfilled with cement/bentonite grout to surface.	645.2
12.5		
15.0		
17.5		
20.0		
22.5		
25.0		
27.5		
30.0		
32.5		

MONITOR INSTALLATION



SAMPLE			
NUMBER	STATE	'N' VALUE	PID (ppm)
1SS	☒	16	0
2SS	☒	29	0
3SS	☒	28	0
4SS	☒	15	0
5SS	☒	8	0
6SS	☒	>100	0

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS ⬭ WATER FOUND ▽ STATIC WATER LEVEL ▼

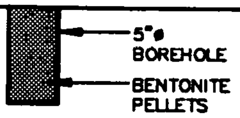
STRATIGRAPHIC AND INSTRUMENTATION LOG
(OVERBURDEN)

(L-45)

PROJECT NAME: LEICA INC. RI/FS
PROJECT NO.: 3967
CLIENT: LEICA INC.
LOCATION: CHEEKTOWAGA, NEW YORK

HOLE DESIGNATION: BH-7-93
DATE COMPLETED: DECEMBER 13, 1993
DRILLING METHOD: HAND AUGER
CRA SUPERVISOR: K. LYNCH

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	MONITOR INSTALLATION	SAMPLE			
				NUMBER	STATE	'N' VALUE	PID (ppm)
	GROUND SURFACE	653.3					
	TOPSOIL(FILL), loamy, some rootlets, black, moist to wet	652.8		1SS	☒		0
2.5	SM-SAND, little silt, soft, brown, moist to wet, slight musty odor	651.5		2SS	☒		0
	ML-SILT(NATIVE), some clay, little sand, red brown, moist	650.8		3SS	☒		0
5.0	END OF HOLE @ 2.5 FT. BGS NOTES: 1. Location is 18.0 ft south of BH-3-93. 2. Soil samples retained for geologic record. 3. Borehole backfilled with bentonite pellets.						
7.5							
10.0							
12.5							
15.0							
17.5							
20.0							
22.5							
25.0							
27.5							
30.0							
32.5							



NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

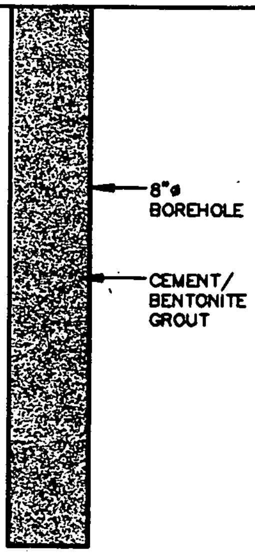
CHEMICAL ANALYSIS ○ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG
(OVERBURDEN)

(L-46)

PROJECT NAME: LEICA INC. R1/FS
PROJECT NO.: 3967
CLIENT: LEICA INC.
LOCATION: CHEEKTOWAGA, NEW YORK

HOLE DESIGNATION: BH-8-94
DATE COMPLETED: APRIL 7, 1994
DRILLING METHOD: 4 1/4" ID HSA
CRA SUPERVISOR: K. LYNCH

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	MONITOR INSTALLATION	SAMPLE			
				NUMBER	STATE	'N' VALUE	PID (ppm)
	GROUND SURFACE	660.1					
	Auger through asphalt	659.1					
2.5	GP-GRAVEL(FILL), some sand, black and brown, moist to wet, slight petroleum odor	658.0		1SS	☒	15	0.5
	ML-SILT(FILL), little sand and gravel, dark brown, dry to moist – some clay, trace to little fine gravel and sand, red brown, dry, trace glass			2SS	☒	7	1
5.0							
	ML-SILT(NATIVE), some clay, little sand, trace fine gravel, very stiff, red brown, dry to moist	654.2		3SS	☒	22	0
7.5				4SS	☒	41	0
10.0				5SS	☒	32	0
12.5	CH-CLAY, little silt and fine sand, soft, plastic, gray and brown, moist	647.9		6SS	☒	11	0
	CL-CLAY, little silt and fine sand, gray and brown, moist	646.6 646.3		7SS	☒	>50	0.1
15.0	SP-SAND, little silt, trace fine subangular gravel, gray, moist	646.0					
	END OF HOLE @ 14.1 FT. BGS						
17.5	NOTES: 1. Soil sample collected from 13.0 to 14.1 ft BGS for chemical analysis of TCL VOCs and TPH.						
20.0	2. Borehole backfilled with cement/bentonite grout.						
22.5							
25.0							
27.5							
30.0							
32.5							

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS ○ WATER FOUND ▽ STATIC WATER LEVEL ▼

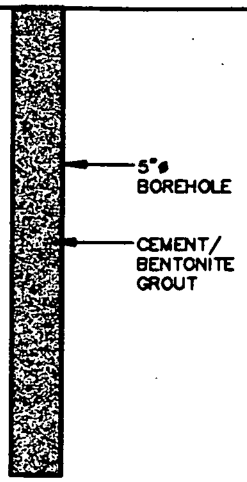
STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(L-47)

PROJECT NAME: LEICA INC. R1/FS
PROJECT NO.: 3967
CLIENT: LEICA INC.
LOCATION: CHEEKTOWAGA, NEW YORK

HOLE DESIGNATION: BH-10-94
DATE COMPLETED: APRIL 7, 1994
DRILLING METHOD: 4 1/4" ID HSA
CRA SUPERVISOR: K. LYNCH

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	MONITOR INSTALLATION	SAMPLE			
				NUMBER	STATE	'N' VALUE	PID (ppm)
	GROUND SURFACE	658.9					
	Auger through asphalt	658.4					
	GM-GRAVEL(FILL), some sand, little brick and slag, brown, black and white, wet			1SS	☒	15	0
2.5	FILL: cinders, clinkers, trace rusted metal, brick, coal, black, brown, gray and white, moist to wet, slight musty odor	656.4		2SS	☒	13	0
5.0	CL-CLAY(FILL), some sand, little gravel, gray, moist to wet	654.4		3SS	☒	19	0
7.5	ML-SILT(NATIVE), some sand, little clay, red brown, dry to moist	652.4		4SS	☒	41	0
10.0	SP-SAND, little to some gravel and silt, gray, moist	650.0		5SS	☒	29	0
				6SS	☒	35	0
12.5	END OF HOLE @ 12.2 FT. BGS NOTES: 1. Soil sample collected from 10.5 to 12.5 ft BGS for chemical analysis for TCL VOCs and TPH. 2. Borehole backfilled with cement/bentonite grout.	646.7					
15.0							
17.5							
20.0							
22.5							
25.0							
27.5							
30.0							
32.5							



NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

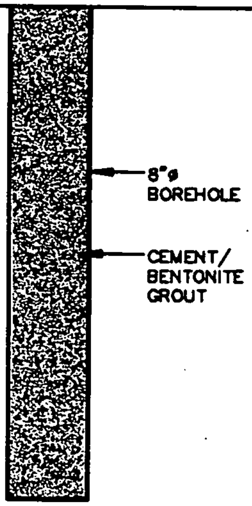
CHEMICAL ANALYSIS ○ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(L-48)

PROJECT NAME: LEICA INC. R1/FS
PROJECT NO.: 3967
CLIENT: LEICA INC.
LOCATION: CHEEKTOWAGA, NEW YORK

HOLE DESIGNATION: BH-11-94
DATE COMPLETED: APRIL 7, 1994
DRILLING METHOD: 4 1/4" ID HSA
CRA SUPERVISOR: K. LYNCH

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE	SAMPLE PID (ppm)
	GROUND SURFACE	659.9					
	Auger through asphalt	659.4					
	GM-GRAVEL(FILL), some coal, little silt and sand, black and gray, moist, slight sweet odor	658.6		1SS	☒	15	0
2.5	ML-SILT(NATIVE), little to some clay, trace to little sand, trace gravel, stiff to very stiff, brown and red brown with gray, dry to moist			2SS	☒	9	0
5.0				3SS	☒	19	NA
7.5				4SS	☒	30	NA
	– little sand, trace subangular gravel, stiff, mottled green, gray, brown, pink and red brown, dry			5SS	☒	17	NA
10.0	SP-SAND, fine to medium grained, moist to wet, red brown, dry to moist	649.4		6SS	☒	17	NA
12.5	SP-SAND(TILL), little subrounded gravel, silt, and clay, fine to medium grained, gray, moist	647.0		7SS	☒	>50	NA
	END OF HOLE @ 12.9 FT. BGS NOTES: 1. Soil sample collected from 10.0 to 12.0 ft BGS for chemical analysis for TCL VOCs and TPH. 2. Borehole backfilled with cement/bentonite grout to surface.						
15.0							
17.5							
20.0							
22.5							
25.0							
27.5							
30.0							
32.5							

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

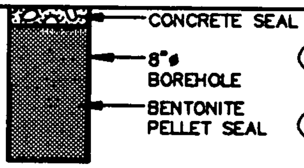
CHEMICAL ANALYSIS ⬭ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG
(OVERBURDEN)

(L-49)

PROJECT NAME: LEICA INC. R1/FS
PROJECT NO.: 3967
CLIENT: LEICA INC.
LOCATION: CHEEKTOWAGA, NEW YORK

HOLE DESIGNATION: BH-DS1-93
DATE COMPLETED: DECEMBER 13, 1993
DRILLING METHOD: 4 1/4" ID HSA
CRA SUPERVISOR: K. LYNCH

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	MONITOR INSTALLATION	SAMPLE			
				NUMBER	STATE	'N' VALUE	PID (ppm)
	GROUND SURFACE	661.4					
	Auger through concrete	660.9	 CONCRETE SEAL				
2.5	SP-SAND(FILL), some fine to medium grained angular gravel, trace concrete, dark brown, moist, slight sulphur odor	659.4	8"ø BOREHOLE	1SS	☒	23	0
	ML-SILT(NATIVE), some clay, little sand, trace fine rounded gravel, dense, red brown, dry	657.4	BENTONITE PELLET SEAL	2SS	☒	20	0
5.0	END OF HOLE @ 4.0 FT. BGS NOTES: 1. Soil sample collected from 1.0 to 4.0 ft BGS for chemical analysis of TCL VOCs, TAL METALS, TPH. 2. Borehole backfilled with bentonite pellets and concrete surface seal						
7.5							
10.0							
12.5							
15.0							
17.5							
20.0							
22.5							
25.0							
27.5							
30.0							
32.5							

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

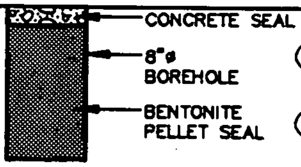
CHEMICAL ANALYSIS ○ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG
(OVERBURDEN)

(L-50)

PROJECT NAME: LEICA INC. R1/FS
PROJECT NO.: 3967
CLIENT: LEICA INC.
LOCATION: CHEEKTOWAGA, NEW YORK

HOLE DESIGNATION: BH-DS2-93
DATE COMPLETED: DECEMBER 13, 1993
DRILLING METHOD: 4 1/4" ID HSA
CRA SUPERVISOR: K. LYNCH

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	MONITOR INSTALLATION	SAMPLE			
				NUMBER	STATE	'N' VALUE	PID (ppm)
	GROUND SURFACE	661.1					
	Augered to 0.5 ft BGS	660.6					
	SP-SAND(FILL), some gravel, brown, moist, aromatic odor	659.1		1SS	☒	16	15.8
2.5	ML-SILT(NATIVE), some clay, very stiff, red brown, dry to moist, no odor below 2.2 ft BG	657.1		2SS	☒	20	0
5.0	END OF HOLE @ 4.0 FT. BGS NOTES: 1. Soil sample collected from 1.0 to 4.0 ft BGS for chemical analysis of TCL VOCs, TAL Metals and TPH. 2. Borehole backfilled with bentonite pellets and concrete surface seal						
7.5							
10.0							
12.5							
15.0							
17.5							
20.0							
22.5							
25.0							
27.5							
30.0							
32.5							

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

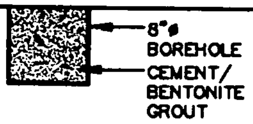
CHEMICAL ANALYSIS ○ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(L-51)

PROJECT NAME: LEICA INC. RI/FS
PROJECT NO.: 3967
CLIENT: LEICA INC.
LOCATION: CHEEKTOWAGA, NEW YORK

HOLE DESIGNATION: BH-DS3-93
DATE COMPLETED: DECEMBER 13, 1993
DRILLING METHOD: 4 1/4" ID HSA
CRA SUPERVISOR: K. LYNCH

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE	SAMPLE PID (ppm)
	GROUND SURFACE	660.7					
	Augered through asphalt	660.2		1SS	☒	19	0
	SP-SAND(FILL), some gravel, trace asphalt, green slag, dark brown, moist to wet, slight oily odor, slight sheen	659.7					
2.5	ML-SILT(NATIVE), some clay, very stiff, red brown, dry, no odor or sheen.	658.7					
5.0	END OF HOLE @ 2.0 FT. BGS NOTES: 1. Soil sample collected from 0.5 to 1.2 ft BGS for chemical analysis of TCL VOCs, TAL Metals and TPH. 2. Borehole backfilled with cement/bentonite grout and concrete.						
7.5							
10.0							
12.5							
15.0							
17.5							
20.0							
22.5							
25.0							
27.5							
30.0							
32.5							

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

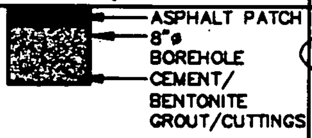
CHEMICAL ANALYSIS ⬭ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG
(OVERBURDEN)

(L-52)

PROJECT NAME: LEICA INC. RI/FS
PROJECT NO.: 3967
CLIENT: LEICA INC.
LOCATION: CHEEKTOWAGA, NEW YORK

HOLE DESIGNATION: BH-DS-E1
DATE COMPLETED: APRIL 7, 1994
DRILLING METHOD: 4 1/4" ID HSA
CRA SUPERVISOR: K. LYNCH



DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE	SAMPLE PID (ppm)
	GROUND SURFACE	660.5					
	Augered through asphalt	660.3					
	GP-GRAVEL(FILL), some sand, trace slag, dark brown, moist to wet	659.4		1SS	☒	7	0
2.5	ML-SILT, some clay, little sand, gray, dry to moist	659.2					
	ML-SILT(NATIVE), little sand and clay, trace gravel, brown, dry to moist	658.5					
5.0	END OF HOLE @ 2.0 FT. BGS NOTES: 1. Soil sample collected from 0.2 to 2.2 ft BGS for chemical analysis of TCL VOCs and TPH. 2. Borehole backfilled with cement/bentonite grout and cuttings and capped with asphalt patch.						
7.5							
10.0							
12.5							
15.0							
17.5							
20.0							
22.5							
25.0							
27.5							
30.0							
32.5							

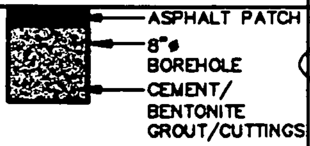
NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS ○ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(L-53)

PROJECT NAME: LEICA INC. RI/FS
PROJECT NO.: 3967
CLIENT: LEICA INC.
LOCATION: CHEEKTOWAGA, NEW YORK
HOLE DESIGNATION: BH-DS-E2
DATE COMPLETED: APRIL 7, 1994
DRILLING METHOD: 4 1/4" ID HSA
CRA SUPERVISOR: K. LYNCH

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	MONITOR INSTALLATION	SAMPLE			
				NUMBER	STATE	'N' VALUE	PID (ppm)
	GROUND SURFACE	660.4					
	Augered through asphalt	659.9		1SS	☒	16	0
	GP-GRAVEL(FILL), some fine sand, gray and brown, dry to moist	658.6					
2.5	ML-SILT(NATIVE), little sand and clay, red brown, dry to moist	657.9					
	END OF HOLE @ 2.5 FT. BGS						
5.0	NOTES: 1. Soil sample collected from 0.5 to 2.5 ft BGS for chemical analysis of TCL VOCs and TPH.						
7.5	2. Borehole backfilled with cement/bentonite grout, cuttings and capped with asphalt patch.						
10.0							
12.5							
15.0							
17.5							
20.0							
22.5							
25.0							
27.5							
30.0							
32.5							

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

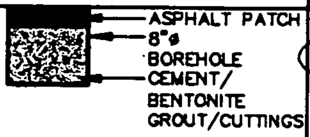
CHEMICAL ANALYSIS ○ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(L-54)

PROJECT NAME: LEICA INC. RI/FS
PROJECT NO.: 3967
CLIENT: LEICA INC.
LOCATION: CHEEKTOWAGA, NEW YORK

HOLE DESIGNATION: BH-DS-N1
DATE COMPLETED: APRIL 7, 1994
DRILLING METHOD: 4 1/4" ID HSA
CRA SUPERVISOR: K. LYNCH

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	MONITOR INSTALLATION	SAMPLE			
				NUMBER	STATE	'N' VALUE	PID (ppm)
	GROUND SURFACE	661.3					
	Augered through asphalt	660.8					
	SP-SAND(FILL), some gravel, little silt, trace pottery, brown, wet	659.9		1SS	☒	7	0
2.5	ML-SILT(NATIVE), little clay, very stiff, red brown	659.3					
5.0	END OF HOLE @ 2.0 FT. BGS NOTES: 1. Soil sample collected from 0.5 to 1.5 ft BGS for chemical analysis of TCL VOCs and TPH. 2. Borehole backfilled with cement/bentonite grout, cuttings and capped with asphalt patch.						
7.5							
10.0							
12.5							
15.0							
17.5							
20.0							
22.5							
25.0							
27.5							
30.0							
32.5							

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

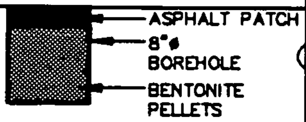
CHEMICAL ANALYSIS ○ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG
(OVERBURDEN)

(L-55)

PROJECT NAME: LEICA INC. R1/FS
PROJECT NO.: 3967
CLIENT: LEICA INC.
LOCATION: CHEEKTOWAGA, NEW YORK

HOLE DESIGNATION: BH-DS-N2
DATE COMPLETED: APRIL 7, 1994
DRILLING METHOD: 4 1/4" ID HSA
CRA SUPERVISOR: K. LYNCH

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	MONITOR INSTALLATION	SAMPLE			
				NUMBER	STATE	'N' VALUE	PID (ppm)
	GROUND SURFACE	662.0					
	Augered through asphalt	661.5					
	SM-SAND(FILL), little silt, gravel and clay, brown, wet	660.6		1SS	☒	7	0
2.5	ML-SILT, little clay and sand, gray, dry to moist	660.0					
	SM-SAND(NATIVE), little silt, trace gravel, very stiff, brown to red brown, dry to moist	659.5					
5.0	END OF HOLE @ 2.5 FT. BGS NOTES: 1. Soil sample collected from 0.5 to 2.0 ft BGS for chemical analysis of TCL VOCs and TPH. 2. Borehole backfilled with bentonite pellets and capped with asphalt patch.						
7.5							
10.0							
12.5							
15.0							
17.5							
20.0							
22.5							
25.0							
27.5							
30.0							
32.5							

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS ○ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(L-56)

PROJECT NAME: LEICA INC. RI/FS

PROJECT NO.: 3967

CLIENT: LEICA INC.

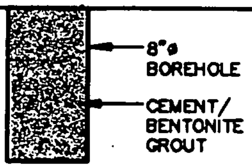
LOCATION: CHEEKTOWAGA, NEW YORK

HOLE DESIGNATION: BH-AST1-93

DATE COMPLETED: DECEMBER 15, 1993

DRILLING METHOD: 4 1/4" ID HSA

CRA SUPERVISOR: K. LYNCH

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	MONITOR INSTALLATION	SAMPLE			
				NUMBER	STATE	'N' VALUE	PID (ppm)
	GROUND SURFACE	660.3					
	GM-GRAVEL(FILL), some silt, little sand, trace brick, little cement, black, dry to moist, no odor			1SS	☒	38	0.3
2.5	ML-SILT(NATIVE), some clay, little gravel, laminated, red brown, dry, no odor	658.3		2SS	☒	30	11
5.0	END OF HOLE @ 4.0 FT. BGS NOTES: 1. Soil sample collected from 0.0 to 4.0 ft BGS for chemical analysis of TCL VOCs, TAL Metals and TPH. 2. Borehole backfilled with cement/bentonite grout.	656.3					
7.5							
10.0							
12.5							
15.0							
17.5							
20.0							
22.5							
25.0							
27.5							
30.0							
32.5							

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

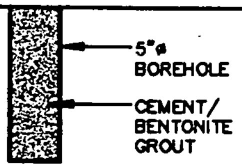
CHEMICAL ANALYSIS ○ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(L-57)

PROJECT NAME: LEICA INC. RI/FS
PROJECT NO.: 3967
CLIENT: LEICA INC.
LOCATION: CHEEKTOWAGA, NEW YORK

HOLE DESIGNATION: BH-WDW1-93
DATE COMPLETED: DECEMBER 15, 1993
DRILLING METHOD: HAND AUGER
CRA SUPERVISOR: K. LYNCH

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE	SAMPLE PID (ppm)
		NA					
	OL-SILT(TOPSOIL), some sand, roots, dark brown, moist, no odor	-0.7	 5"ø BOREHOLE CEMENT/ BENTONITE GROUT				0
2.5	ML-SILT(NATIVE), little to some clay, little sand, trace fine gravel, very stiff, red brown, no odor, no obvious contamination						0
	END OF HOLE @ 4.0 FT. BGS	-4.0					
5.0	NOTES: 1. Soil sample collected form borehole 3 ft east of BH-WDWA-93. Below 0.7 ft BGS was a gravel and stone filled dry well sump. 2. Soil sample collected from 0.7 to 0.9 ft BGS of fines from stone/gravel for chemical analysis of TCL VOCs, TAL Metals, TPH. 3. Borehole backfilled to 0.5 ft BGS with cement/bentonite grout, grass and topsoil replaced.						
7.5							
10.0							
12.5							
15.0							
17.5							
20.0							
22.5							
25.0							
27.5							
30.0							
32.5							

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

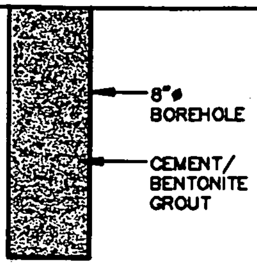
CHEMICAL ANALYSIS ○ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG
(OVERBURDEN)

(L-58)

PROJECT NAME: LEICA INC. RI/FS
PROJECT NO.: 3967
CLIENT: LEICA INC.
LOCATION: CHEEKTOWAGA, NEW YORK

HOLE DESIGNATION: BH-U1-93
DATE COMPLETED: DECEMBER 3, 1993
DRILLING METHOD: 4 1/4" ID HSA
CRA SUPERVISOR: K. LYNCH

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE	SAMPLE PID (ppm)
	GROUND SURFACE	656.3					
	Augered through asphalt	655.8	 				
2.5	ML-SILT(FILL), some clay, trace gravel and clinkers, loose, dark gray, moist to wet, slight petroluem odor	653.8		1SS	☒	13	33
	ML-SILT(NATIVE), some clay, little sand, laminated, dark gray, dry to moist Moved 1 ft north and augered to 2.5 ft BGS	651.8		2SS	☒	7	40
5.0	GM-GRAVEL, trace brick, fine to medium, angular, gray, wet, sheen, petroleum odor	651.1		3SS	☒	23	61
	SM-SAND, trace silt, fine to medium grained, dark gray, moist to wet, sheen, petroleum odor	650.4					
7.5	GM-GRAVEL, little sand, fine to medium, angular, dark gray, wet, sheen, petroleum odor	649.8					
10.0	ML-SILT(NATIVE), some clay, little sand, red brown, dry to moist						
12.5	END OF HOLE @ 6.5 FT. BGS NOTES: 1. Soil samples retained for geologic record only. 2. Borehole backfilled with cement/bentonite grout to surface.						
15.0							
17.5							
20.0							
22.5							
25.0							
27.5							
30.0							
32.5							

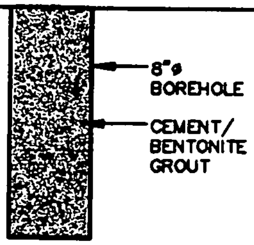
NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS ○ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG
(OVERBURDEN)

(L-59)

PROJECT NAME: LEICA INC. R1/FS
PROJECT NO.: 3967
CLIENT: LEICA INC.
LOCATION: CHEEKTOWAGA, NEW YORK
HOLE DESIGNATION: BH-U2-94
DATE COMPLETED: JANUARY 17, 1994
DRILLING METHOD: 4 1/4" ID HSA
CRA SUPERVISOR: K. LYNCH

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE	SAMPLE PID (ppm)
	GROUND SURFACE	*657.8*					
	Augered only to 4.0 ft BGS						
2.5							
	CL-CLAY(NATIVE), some silt and fine sand, red brown, dry to moist	*653.8*					
5.0				1SS	☒	11	1.6
	SM-SAND, trace silt and clay, brown, moist, no odor or sheen	*652.5*					
	END OF HOLE @ 6.0 FT. BGS	*651.8*					
7.5	NOTES: 1. Soil samples retained for geologic record only. 2. Borehole backfilled with cement/bentonite grout to surface. 3. Sewer invert at 6.0 ft BGS						
10.0							
12.5							
15.0							
17.5							
20.0							
22.5							
25.0							
27.5							
30.0							
32.5							

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

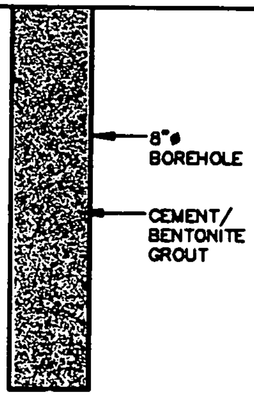
CHEMICAL ANALYSIS ○ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG
(OVERBURDEN)

(L-60)

PROJECT NAME: LEICA INC. RI/FS
PROJECT NO.: 3967
CLIENT: LEICA INC.
LOCATION: CHEEKTOWAGA, NEW YORK

HOLE DESIGNATION: BH-U3-94
DATE COMPLETED: JANUARY 17, 1994
DRILLING METHOD: 4 1/4" ID HSA
CRA SUPERVISOR: K. LYNCH

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	MONITOR INSTALLATION	SAMPLE			
				NUMBER	STATE	'N' VALUE	PID (ppm)
	GROUND SURFACE	658.3					
	Augered only to 6.0 ft BGS						
2.5							
5.0							
	ML-SILT, some sand, little clay, trace gravel, brown, moist	652.3		1SS	☒	3	NA
7.5	SP-SAND(NATIVE), fine to medium grained, gray, moist to wet, no sheen, no odor	650.7		2SS	☒	45	
10.0	END OF HOLE @ 10.0 FT. BGS NOTES: 1. Soil samples retained for geologic record only. 2. Borehole backfilled with cement/bentonite grout to surface. 3. PID fault due to cold weather/heavy snow. 4. Sewer invert at 9.0 ft BGS.	648.3					
12.5							
15.0							
17.5							
20.0							
22.5							
25.0							
27.5							
30.0							
32.5							

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

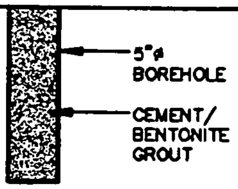
CHEMICAL ANALYSIS ○ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG
(OVERBURDEN)

(L-61)

PROJECT NAME: LEICA INC. RI/FS
PROJECT NO.: 3967
CLIENT: LEICA INC.
LOCATION: CHEEKTOWAGA, NEW YORK

HOLE DESIGNATION: BH-U4-94
DATE COMPLETED: APRIL 13, 1994
DRILLING METHOD: HAND AUGER
CRA SUPERVISOR: K. LYNCH

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE	SAMPLE PID (ppm)
	GROUND SURFACE	653.5					
	ML-SILT(FILL), some clay, little sand, coal, brick, glass - no coal, brick or glass, red brown, dry to moist	651.5					0
2.5	SP-SAND, little silt, trace gravel, medium to coarse grained, white with red brown, dry to moist, no odor or sheen	651.0					0
5.0	ML-SILT(NATIVE), some clay, little sand and gravel, red brown and gray, moist to wet - wet	649.0					0
7.5	END OF HOLE @ 4.5 FT. BGS NOTES: 1. Soil samples retained for geologic record only. 2. Borehole backfilled with cement/bentonite grout to surface.						
10.0							
12.5							
15.0							
17.5							
20.0							
22.5							
25.0							
27.5							
30.0							
2.5							

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

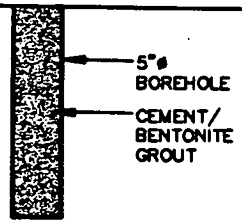
CHEMICAL ANALYSIS ○ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG
(OVERBURDEN)

(L-62)

PROJECT NAME: LEICA INC. RI/FS
PROJECT NO.: 3967
CLIENT: LEICA INC.
LOCATION: CHEEKTOWAGA, NEW YORK

HOLE DESIGNATION: BH-U5-94
DATE COMPLETED: APRIL 13, 1994
DRILLING METHOD: HAND AUGER
CRA SUPERVISOR: K. LYNCH

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE	SAMPLE PID (ppm)
	GROUND SURFACE	653.3					
	OL-LOAM, dark brown, moist, no odor						0
	ML-SILT, little to some clay and sand, trace coal and brick, stiff, red brown, dry to moist	652.3					
2.5							0
5.0	ML-SILT(NATIVE), little clay, laminated, red brown, no odor	648.3 647.8					0
	END OF HOLE @ 5.5 FT. BGS						
7.5	NOTES: 1. Soil samples retained for geologic record only. 2. Borehole backfilled with cement/bentonite grout to surface.						
10.0							
12.5							
15.0							
17.5							
20.0							
22.5							
25.0							
27.5							
30.0							
32.5							

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

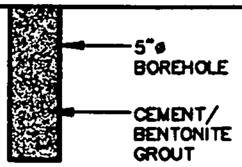
CHEMICAL ANALYSIS ○ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG
(OVERBURDEN)

(L-63)

PROJECT NAME: LEICA INC. R1/FS
PROJECT NO.: 3967
CLIENT: LEICA INC.
LOCATION: CHEEKTOWAGA, NEW YORK

HOLE DESIGNATION: BH-U6-94
DATE COMPLETED: APRIL 13, 1994
DRILLING METHOD: HAND AUGER
CRA SUPERVISOR: K. LYNCH

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE	SAMPLE PID (ppm)
	GROUND SURFACE	652.5					
	ML-SILT(FILL), some clay and sand, little gravel, trace coal and brick, red brown, gray, and dark brown, no odor						
2.5							
	GM-GRAVEL, some silt, red brown, moist to wet	649.5					
5.0	ML-SILT(NATIVE), trace gravel, laminated, red brown, dry to moist	649.0					
	END OF HOLE @ 4.0 FT. BGS	648.5					
	NOTES:						
7.5	1. Soil samples retained for geologic record only.						
	2. Borehole backfilled with cement/bentonite grout to surface.						
10.0							
12.5							
15.0							
17.5							
20.0							
22.5							
25.0							
27.5							
30.0							
32.5							

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS ○ WATER FOUND ▽ STATIC WATER LEVEL ▼

GRAPHICS, SYMBOLS AND ABBREVIATIONS ON LOGS

SAMPLE TYPES and TESTS

▨	SS	Split Spoon Sample	
⧖	SN	Non-Standard Split Spoon Sample	
I	ST	Shelby Tube Sample : (unconfined compression or unconsolidated undrained test)	- ◆
▯	DS	Denision Type Sample	
▯	PS	Piston Type Sample	
Ξ	CS	Continuous Sample	
⧗	GS	Grab Sample	
▩	WS	Wash Sample	
▧	BQ	BQ Core Sample	
▧	HQ	HQ Core Sample	
▧	NQ	NQ Core Sample	
⧖	DT	Dynamic Penetration Test	
■	VT	Field Vane Test (undisturbed)	- +
■	VT	Field Vane Test (remoulded)	- ⊕

PENETRATION RESISTANCES

Dynamic Penetration Resistance

The number of blows by a 63.6 kg (140 lb) hammer dropped 760 mm (30 in.) to drive uncased a 50 mm (2 in.) diameter, 60^o cone attached to "A" size drill rods for a distance of 300 mm (12 in.).

Standard Penetration Resistance (N Value)

The number of blows by a 63.6 kg (140 lb) hammer dropped 760 mm (30 in.) required to drive a 50 mm (2 in.) split spoon sampler for a distance of 300 mm (12 in.).

ABBREVIATIONS

DTPL: Drier Than Plastic Limit
APL: About Plastic Limit
WTPL: Wetter Than Plasic Limit
K: Hydraulic Conductivity (m/s)
C_u: Undrained Shear Strength (kPa)

GRAIN SIZE CLASSIFICATION

	%
"trace", eg. trace sand	1 - 10
"some", eg. some sand	10 - 20
adjective, eg. sandy	20 - 35
"and", eg. and sand	35 - 50
noun, eg. sand	>50

Note: Classification Divisions Based on Modified M.I.T. Grain Size Scale

SOIL DESCRIPTIONS

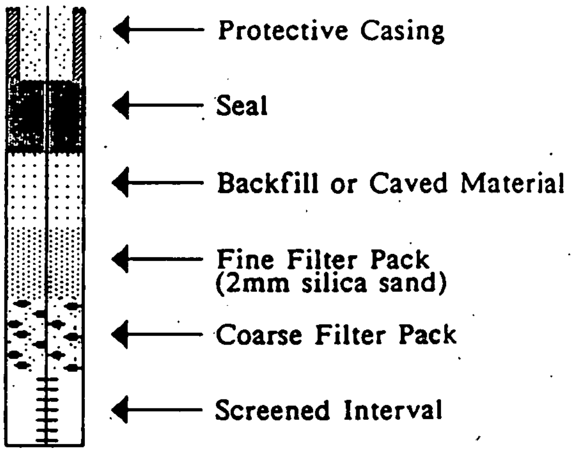
Cohesionless Soils

Relative Density	N Value
Very loose	0 to 4
Loose	4 to 10
Compact	10 to 30
Dense	30 to 50
Very Dense	over 50

Cohesive Soils

Consistency	C_u(kPa)	N Value
Very soft	0 to 12	0 to 2
Soft	12 to 25	2 to 4
Firm	25 to 50	4 to 8
Stiff	50 to 100	8 to 15
Very Stiff	100 to 200	15 to 30
Hard	over 200	over 30

MONITOR DETAILS



Gartner Lee Inc.

C

APPENDIX C

WELL DEVELOPMENT RECORDS

WELL DEVELOPMENT DATA SHEET

Project Name: LEICA INC RI/FS Project Number: 3967

Monitoring Well Number: MW-23 Date of Development: 4/12/94

Well Type: ☒ Overburden ☐ Bedrock

Development Crew Members : K. LYNCH, J. RANER

WELL DEVELOPMENT INFORMATION

Ground Elevation: ______ feet Initial Depth to Water: 3.18 feet

Groundwater Elevation: ______ feet Casing Depth: — feet

Well Bottom Depth: 13.5 feet Casing Diameter: 2 inches

Screen/Corehole Diameter: 2 inches

One Well Volume: 1.72 gallons Required Number of Well Volumes: 10

Required Development Volume: 17.5 gallons NAPL present: ☐ Yes ☒ No

Development Method: Peristaltic Pump & Teflon Tubing

DEVELOPMENT FIELD MEASUREMENTS

Well Volume Number		Required Field Measurements			
Volume	Total Gallons	pH (S.U.)	Specific Conductance (umhos cm^3)	Temperature (°C)	Comments
1	1.7	6.20	1530	NM	Brown, Cloudy, No Sheen, No odor
2	3.4	6.44	1660	↓	Clearer
3	5.0	6.73	1440		Cloudy, white gray, no Sheen, no odor
DRY	—		—	—	—
4	6.7	*	—	NM	Clear to Sl. cloudy, no Sheen, no odor
5	8.4	↓	—	↓	
6	10.0		—		↓
7	11.7		1450		
8	13.5		1380		
9	15.0		1440		
10	16.7		1400		

Comments: * Meter Failed. Development complete, well surged after every other volume using tubing

D

APPENDIX D

RISING HEAD TEST CALCULATIONS

TABLE X

SINGLE WELL RESPONSE TEST RESULTS
LEICA INC.
CHEEKTOWAGA, NEW YORK

Well Designation	*Static Water Elevation (ft AMSL)*	*Test Type*	*Analysis Method*	*Transmissivity (ft^2/sec)*	*Saturated Thickness (ft) (3)*	*Hydraulic Conductivity (ft/sec)*	*Hydraulic Conductivity (cm/sec) (4)*	*Generalized Lithological Description of Screened Material*
MW-1	654.64	Rising Head	Bower & Rice (1)	--	4.10	4.56E-06	1.39E-04	Silty clay till, silty sand, trace gravel
MW-2	650.45	Rising Head	Bower & Rice	--	1.94	2.73E-04	8.32E-03	Silty sand, gravel
	650.43	Rising Head	Bower & Rice	--	1.92	3.45E-04	1.05E-02	Silty sand, gravel
MW-3	650.09	Rising Head	Cooper et al (2)	2.74E-05	3.50	7.83E-06	2.39E-04	Silty clay till, silty sand, trace gravel
MW-5	650.52	Rising Head	Bower & Rice	–	3.00	3.55E-07	1.08E-05	Silty clay, sand, trace gravel
MW-13	652.27	Rising Head	Cooper et al	6.30E-06	4.60	1.37E-06	4.18E-05	Silt, sand, trace gravel
MW-14	651.50	Rising Head	Cooper et al	3.63 E-06	4.10	8.85E-07	2.70E-05	Sand, trace gravel, trace clay (dense)
MW-15	653.03	Rising Head	Cooper et al	2.41E-05	4.40	5.48E-06	1.67E-04	Silt, sand, some clay, trace gravel
MW-19	648.89	Rising Head	Bower & Rice	–	1.75	1.02E-04	3.11E-03	Silt, sand, some clay, trace gravel
	648.84	Rising Head	Bower & Rice	–	1.70	2.64E-05	8.05E-04	Silt, sand, some clay, trace gravel
MW-22	643.21	Rising Head	Bower & Rice	–	1.40	2.55E-06	7.77E-05	Sand, little silt, trace gravel
MW-23	646.20	Rising Head	Bower & Rice	–	6.02	2.26E-05	6.89E-04	Silt, sand, little clay, trace gravel

Notes:

(1) Bower & Rice solution generally used for unconfined aquifer situations, where the screen straddle the water table - solution yields hydraulic conductivity value.
(2) Cooper et al. solution generally used for confined aquifer situations - solution yields transmissivity value.
(3) The saturated thickness of the bedrock aquifer was assumed to be 35 feet, based on depth of penetration of the deepest well. The actual saturated thickness is likely greater than 35 feet.
(4) Hydraulic Conductivity for Cooper et al. solutions calculated as transmissivity divided by the saturated thickness of aquifer.

TABLE X

SINGLE WELL RESPONSE TEST RESULTS
LEICA INC.
CHEEKTOWAGA, NEW YORK

Well Designation	*Static Water Elevation (ft AMSL)*	*Test Type*	*Analysis Method*	*Transmissivity (ft^2/sec)*	*Saturated Thickness (ft) (3)*	*Hydraulic Conductivity (ft/sec)*	*Hydraulic Conductivity (cm/sec) (4)*	*Generalized Lithological Description of Screened Material*
MW-1A	643.34	Rising Head	Bower & Rice	--	28.16	1.80E-04	5.49E-03	Limestone, trace vertical fractures
	643.34	Rising Head	Bower & Rice	--	28.16	8.49E-05	2.59E-03	Limestone, trace vertical fractures
MW-2A	650.34	Rising Head	Cooper et al	9.41E-04	35.0	2.69E-05	8.20E-04	Limestone, trace fractures
	650.34	Rising Head	Cooper et al	5.40E-03	35.0	1.54E-04	4.69E-03	Limestone, trace fractures
	650.34	Rising Head	Cooper et al	3.91E-03	35.0	1.12E-04	3.41E-03	Limestone, trace fractures
MW-5A	650.05	Rising Head	Cooper et al	1.07E-04	35.0	3.06E-06	9.33E-05	Limestone, trace vertical fractures
MW-6A	643.32	Rising Head	Bower & Rice	--	32.6	7.23E-05	2.20E-03	Limestone, weathered fractures
MW-13A	649.06	Rising Head	Cooper et al	1.21E-04	35.0	3.46E-06	1.05E-04	Limestone, weathered fractures
MW-14A	648.69	Rising Head	Cooper et al	1.75E-02	35.0	5.00E-04	1.52E-02	Limestone, weathered fractures
	648.69	Rising Head	Cooper et al	2.07E-02	35.0	5.91E-04	1.80E-02	Limestone, weathered fractures
MW-15A	649.31	Rising Head	Cooper et al	3.77E-03	35.0	1.08E-04	3.28E-03	Limestone, weathered fractures
	649.30	Rising Head	Insufficient Data to Perform Analysis					
	649.31	Rising Head	Insufficient Data to Perform Analysis					
MW-17A	652.72	Rising Head	Insufficient Data to Perform Analysis					
	652.72	Rising Head	Insufficient Data to Perform Analysis					

Notes:

(1) Bower & Rice solution generally used for unconfined aquifer situations, where the screen straddle the water table - solution yields hydraulic conductivity value.
(2) Cooper et al. solution generally used for confined aquifer situations - solution yields transmissivity value.
(3) The saturated thickness of the bedrock aquifer was assumed to be 35 feet, based on depth of penetration of the deepest well. The actual saturated thickness is likely greater than 35 feet.
(4) Hydraulic Conductivity for Cooper et al. solutions calculated as transmissivity divided by the saturated thickness of aquifer.

Job No: 3967 MW1 Date: 09/13/94 Page: 1/1

Client : Leica Inc.
Site Location : Cheektowaga, New York
Project No : 3967
Test Type : RISING HEAD TEST
Observation Well : MW-1
Start Date/Time : 03/23/94 | 00:00:00
Reference Description : Top of Casing Elevation
Reference Elevation : 662.38 ft AMSL

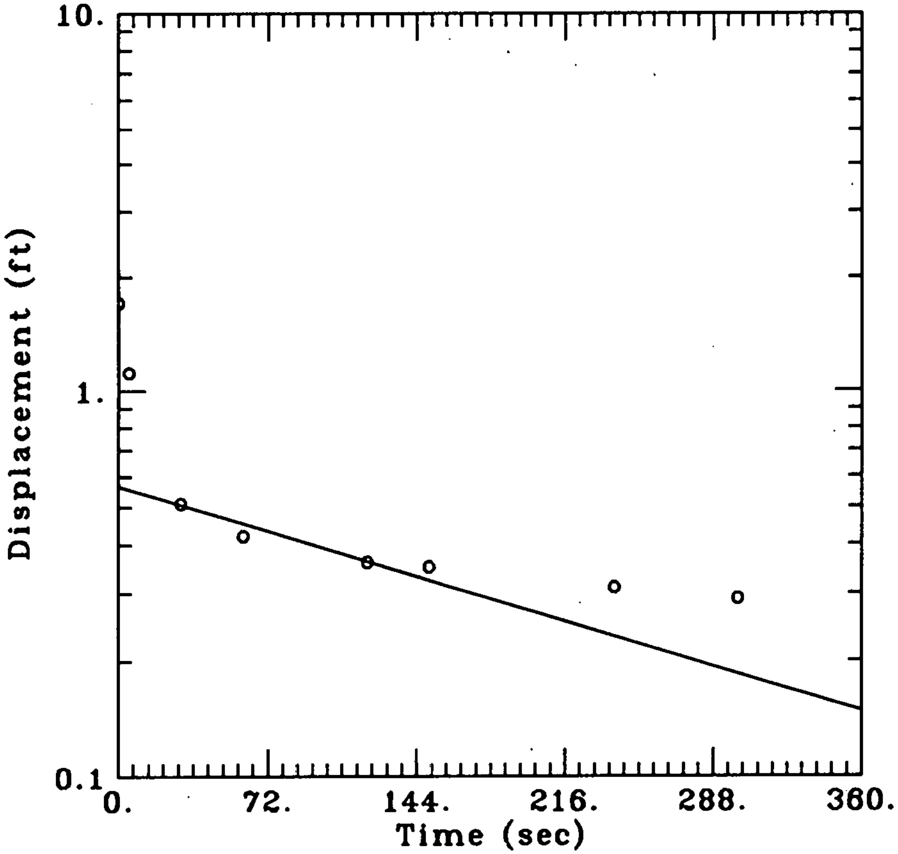
Static Water Level : 7.74 ft

Water level measured from : TOP OF CASING ELEVATION

ELAPSED TIME (sec)	WATER LEVEL (ft)	WATER ELEV. (ft AMSL)	DRAWDOWN (ft)
5	8.85	653.53	1.11
30	8.25	654.13	0.51
60	8.16	654.22	0.42
90	8.12	654.26	0.38
120	8.10	654.28	0.36
150	8.09	654.29	0.35
180	8.08	654.30	0.34
240	8.05	654.33	0.31
300	8.03	654.35	0.29
360	8.02	654.36	0.28

Conestoga Rovers & Associates	Client: **Leica Inc.**
Project No.: **3967**	Location: **Cheektowaga, New York**

RISING HEAD TEST @ MW-1



DATA SET:
mw1.dat
09/13/94

AQUIFER TYPE:
Unconfined
SOLUTION METHOD:
Bouwer-Rice
TEST DATE:
03/23/94
TEST WELL:
MW-1
OBS. WELL:
MW-1

ESTIMATED PARAMETERS:
K = 4.5622E-06 ft/sec
y0 = 0.5661 ft

TEST DATA:
H0 = 1.703 ft
rc = 0.083 ft
rw = 0.333 ft
L = 5.6 ft
b = 4.1 ft
H = 4.86 ft

Client : Leica Inc.
Site Location : Cheektowaga, New York
Project No : 3967
Test Type : RISING HEAD TEST
Observation Well : MW-2
Start Date/Time : 03/23/94 | 00:00:00
Reference Description : Top of Casing Elevation
Reference Elevation : 657.01 ft AMSL

Static Water Level : 6.56 ft

Water level measured from : TOP OF CASING ELEVATION

ELAPSED TIME (sec)	WATER LEVEL (ft)	WATER ELEV. (ft AMSL)	DRAWDOWN (ft)
5	6.64	650.37	0.08
30	6.58	650.43	0.02
60	6.58	650.43	0.02
90	6.58	650.43	0.02
120	6.58	650.43	0.02
150	6.58	650.43	0.02
180	6.58	650.43	0.02

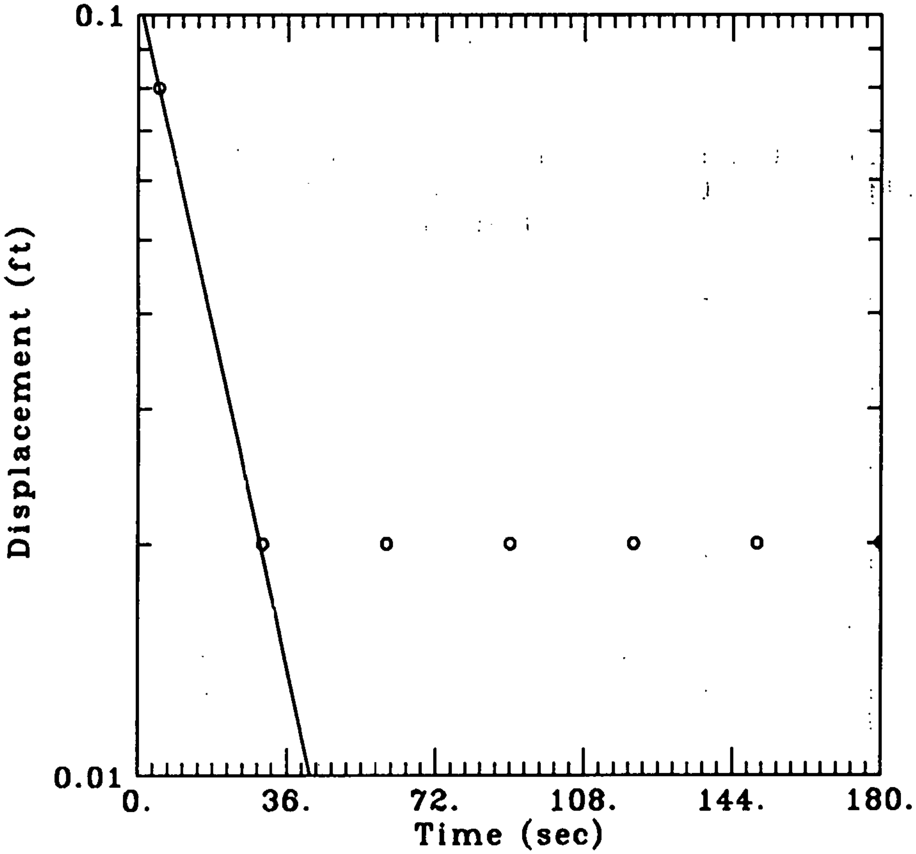
Conestoga Rovers & Associates

Client: **Leica Inc.**

Project No.: **3967**

Location: **Cheektowaga, New York**

RISING HEAD TEST @ MW-2 (1)



DATA SET:
mw2_1.dat
09/13/94

AQUIFER TYPE:
Unconfined
SOLUTION METHOD:
Bouwer-Rice
TEST DATE:
03/23/94
TEST WELL:
MW-2
OBS. WELL:
MW-2

ESTIMATED PARAMETERS:
K = 0.0002732 ft/sec
y0 = 0.1058 ft

TEST DATA:
H0 = 0.823 ft
rc = 0.195 ft
rw = 0.333 ft
L = 5.5 ft
b = 1.94 ft
H = 1.94 ft

Client : Leica Inc.
Site Location : Cheektowaga, New York
Project No : 3967
Test Type : RISING HEAD TEST
Observation Well : MW-2
Start Date/Time : 03/23/94 | 00:00:00
Reference Description : Top of Casing Elevation
Reference Elevation : 657.01 ft AMSL

Static Water Level : 6.58 ft

Water level measured from : TOP OF CASING ELEVATION

ELAPSED TIME (sec)	WATER LEVEL (ft)	WATER ELEV. (ft AMSL)	DRAWDOWN (ft)
5	7.65	649.36	1.07
30	7.59	649.42	1.01
60	6.59	650.42	0.01
90	6.58	650.43	0.00

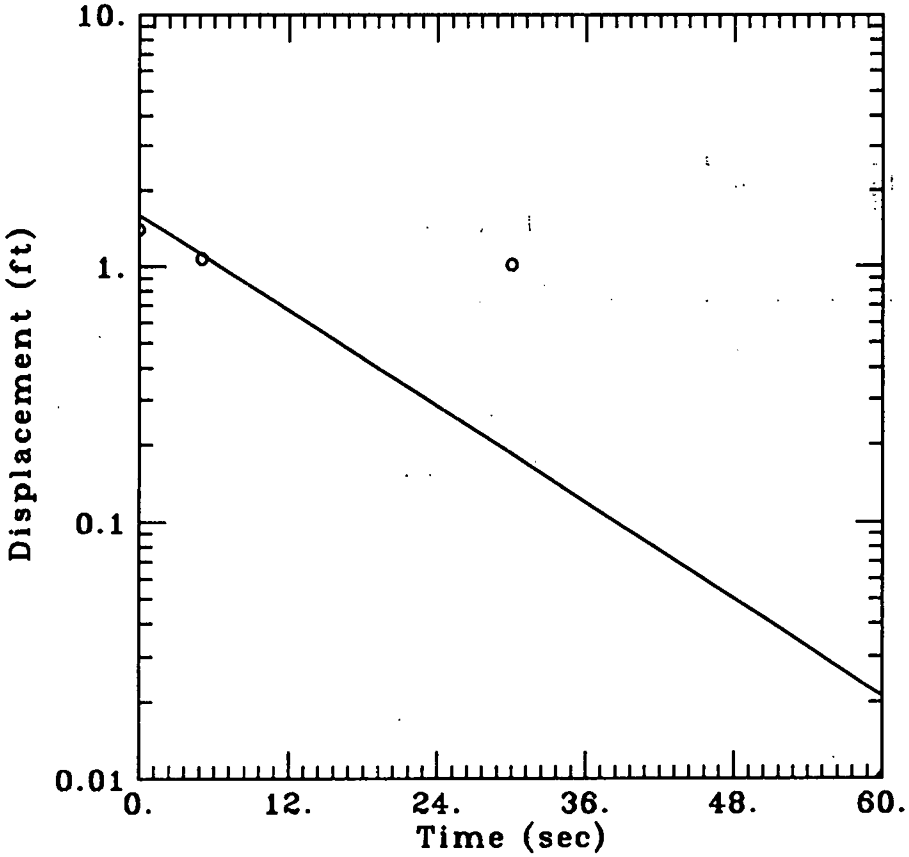
Conestoga Rovers & Associates

Client: **Leica Inc.**

Project No.: **3967**

Location: **Cheektowaga, New York**

RISING HEAD TEST @ MW-2 (2)



DATA SET:
mw2_2.dat
09/13/94

AQUIFER TYPE:
Unconfined
SOLUTION METHOD:
Bouwer-Rice
TEST DATE:
03/23/94
TEST WELL:
MW_2
OBS. WELL:
MW-2

ESTIMATED PARAMETERS:
K = 0.0003447 ft/sec
y0 = 1.583 ft

TEST DATA:
H0 = 1.391 ft
rc = 0.195 ft
rw = 0.333 ft
L = 5.5 ft
b = 1.92 ft
H = 1.92 ft

Job No: 3967 MW3 Date: 09/13/94 Page: 1/1

Client : Leica Inc.
Site Location : Cheektowaga, New York
Project No : 3967
Test Type : RISING HEAD TEST
Observation Well : MW-3
Start Date/Time : 03/23/94 | 00:00:00
Reference Description : Top of Casing Elevation
Reference Elevation : 655.94 ft AMSL

Static Water Level : 5.85 ft

Water level measured from : TOP OF CASING ELEVATION

ELAPSED TIME (sec)	WATER LEVEL (ft)	WATER ELEV. (ft AMSL)	DRAWDOWN (ft)
5	7.30	648.64	1.45
30	6.82	649.12	0.97
60	6.69	649.25	0.84
90	6.62	649.32	0.77
120	6.55	649.39	0.70
150	6.51	649.43	0.66
180	6.50	649.44	0.65
240	6.45	649.49	0.60
300	6.41	649.53	0.56
360	6.37	649.57	0.52
420	6.34	649.60	0.49
480	6.31	649.63	0.46
540	6.28	649.66	0.43
600	6.24	649.70	0.39
660	6.22	649.72	0.37
720	6.19	649.75	0.34
780	6.17	649.77	0.32
840	6.14	649.80	0.29
900	6.11	649.83	0.26
960	6.08	649.86	0.23
1020	6.06	649.88	0.21
1080	6.04	649.90	0.19
1140	6.02	649.92	0.17
1200	6.01	649.93	0.16
1260	5.99	649.95	0.14

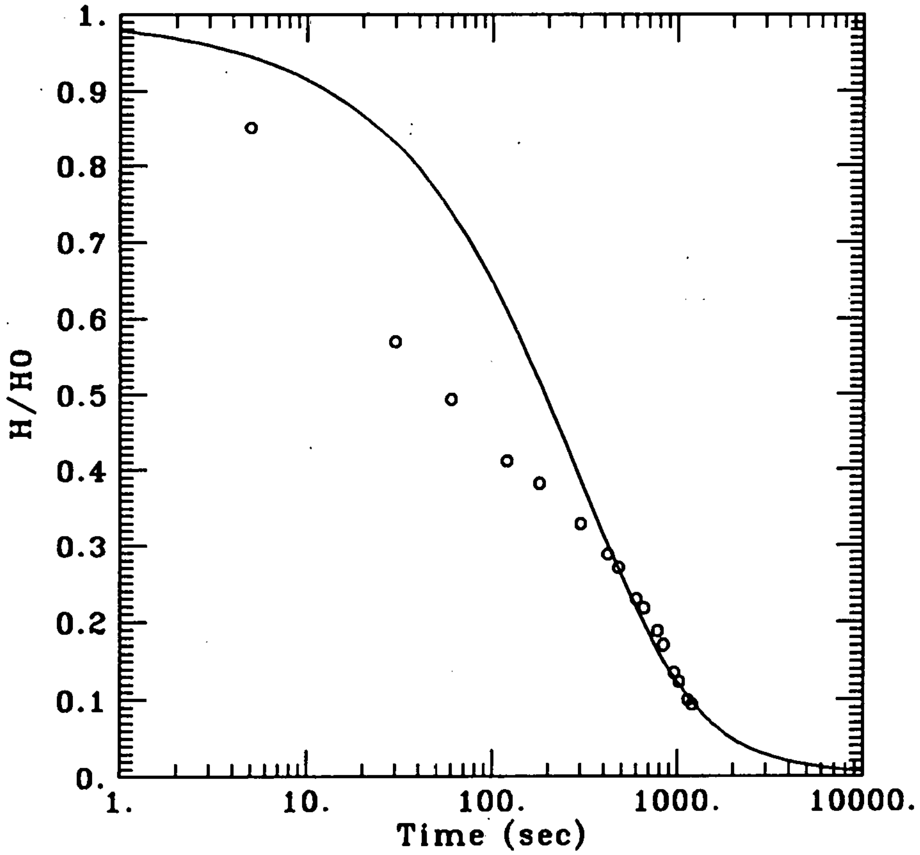
Conestoga Rovers & Associates

Client: **Leica Inc.**

Project No.: **3967**

Location: **Cheektowaga, New York**

RISING HEAD TEST @ MW-3



DATA SET:
mw3.dat
09/13/94

AQUIFER TYPE:
Confined
SOLUTION METHOD:
Cooper et al.
TEST DATE:
03/23/94
TEST WELL:
MW-3
OBS. WELL:
MW-3

ESTIMATED PARAMETERS:
T = 2.7363E-05 ft^2/sec
S = 0.001

TEST DATA:
H0 = 1.703 ft
rc = 0.083 ft
rw = 0.333 ft

Client	: Leica Inc.
Site Location	: Cheektowaga, New York
Project No	: 3967
Test Type	: RISING HEAD TEST
Observation Well	: MW-5
Start Date/Time	: 03/23/94 | 00:00:00
Reference Description	: Top of Casing Elevation
Reference Elevation	: 654.80 ft AMSL
Static Water Level	: 4.28 ft
Water level measured from	: TOP OF CASING ELEVATION

ELAPSED TIME (sec)	WATER LEVEL (ft)	WATER ELEV. (ft AMSL)	DRAWDOWN (ft)
5	5.43	649.37	1.15
30	5.41	649.39	1.13
60	5.39	649.41	1.11
90	5.38	649.42	1.10
120	5.37	649.43	1.09
180	5.34	649.46	1.06
300	5.32	649.48	1.04
600	5.27	649.53	0.99
1200	5.15	649.65	0.87
1800	5.06	649.74	0.78
2400	4.95	649.85	0.67
3000	4.88	649.92	0.60
3600	4.82	649.98	0.54
4200	4.76	650.04	0.48
4800	4.70	650.10	0.42
5400	4.65	650.15	0.37
6000	4.61	650.19	0.33
6600	4.56	650.24	0.28
7200	4.50	650.30	0.22

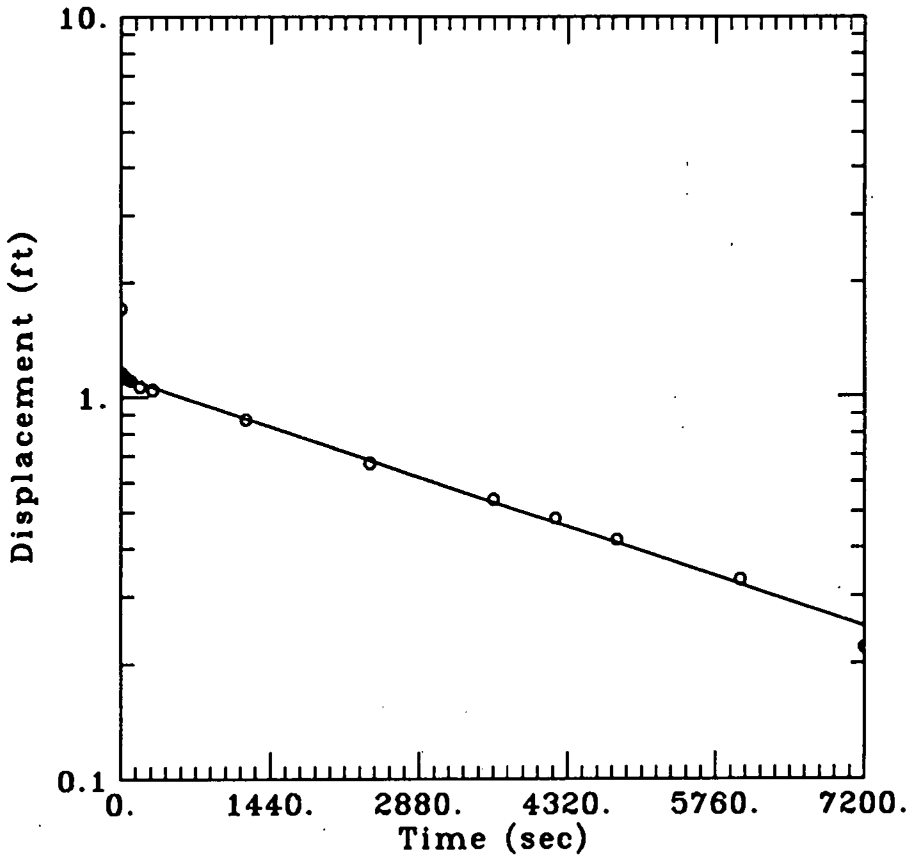
Conestoga Rovers & Associates

Client: **Leica Inc.**

Project No.: **3967**

Location: **Cheektowaga, New York**

RISING HEAD TEST @ MW-5



DATA SET:
mw5.dat
09/13/94

AQUIFER TYPE:
Unconfined
SOLUTION METHOD:
Bouwer-Rice
TEST DATE:
03/23/94
TEST WELL:
MW-5
OBS. WELL:
MW-5

ESTIMATED PARAMETERS:
K = 3.5519E-07 ft/sec
y0 = 1.124 ft

TEST DATA:
H0 = 1.703 ft
rc = 0.083 ft
rw = 0.333 ft
L = 4.4 ft
b = 3. ft
H = 7.62 ft

Job No: 3967 MW13 Date: 09/13/94 Page: 1/1

Client : Leica Inc.
Site Location : Cheektowaga, New York
Project No : 3967
Test Type : RISING HEAD TEST
Observation Well : MW-13
Start Date/Time : 03/23/94 | 00:00:00
Reference Description : Top of Casing Elevation
Reference Elevation : 654.66 ft AMSL

Static Water Level : 2.39 ft

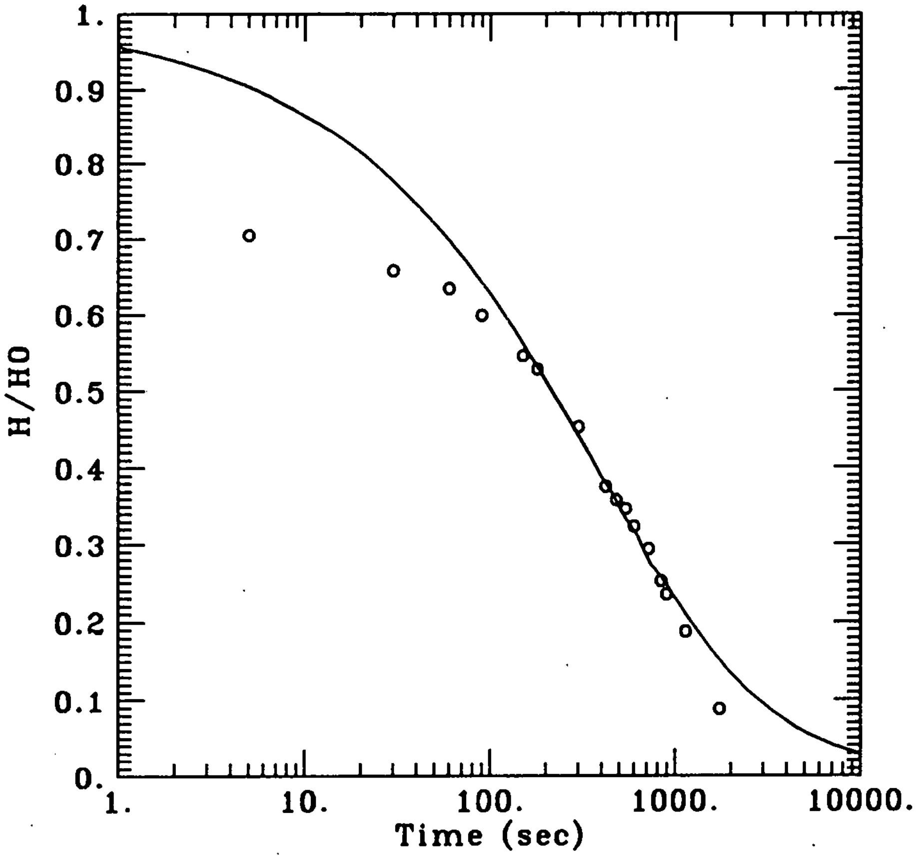
Water level measured from : TOP OF CASING ELEVATION

ELAPSED TIME (sec)	WATER LEVEL (ft)	WATER ELEV. (ft AMSL)	DRAWDOWN (ft)
5	3.59	651.07	1.20
30	3.51	651.15	1.12
60	3.47	651.19	1.08
90	3.41	651.25	1.02
120	3.37	651.29	0.98
150	3.32	651.34	0.93
180	3.29	651.37	0.90
240	3.22	651.44	0.83
300	3.16	651.50	0.77
360	3.07	651.59	0.68
420	3.03	651.63	0.64
480	3.00	651.66	0.61
540	2.98	651.68	0.59
600	2.94	651.72	0.55
660	2.91	651.75	0.52
720	2.89	651.77	0.50
780	2.85	651.81	0.46
840	2.82	651.84	0.43
900	2.79	651.87	0.40
1020	2.75	651.91	0.36
1140	2.71	651.95	0.32
1440	2.62	652.04	0.23
1740	2.54	652.12	0.15
1920	2.50	652.16	0.11

Conestoga Rovers & Associates | Client: **Leica Inc.**

Project No.: **3967** | Location: **Cheektowaga, New York**

RISING HEAD TEST @ MW-13



DATA SET:
mw13.dat
09/13/94

AQUIFER TYPE:
Confined

SOLUTION METHOD:
Cooper et al.

TEST DATE:
03/23/94

TEST WELL:
MW-13

OBS. WELL:
MW-13

ESTIMATED PARAMETERS:
$T = 6.3001E\text{-}06\ ft^2/sec$
$S = 0.02645$

TEST DATA:
H0 = 1.703 ft
rc = 0.083 ft
rw = 0.333 ft

Job No: 3967 MW14 Date: 09/13/94 Page: 1/1

Client : Leica Inc.
Site Location : Cheektowaga, New York
Project No : 3967
Test Type : RISING HEAD TEST
Observation Well : MW-14
Start Date/Time : 03/23/94 | 00:00:00
Reference Description : Top of Casing Elevation
Reference Elevation : 653.38 ft AMSL

Static Water Level : 1.88 ft

Water level measured from : TOP OF CASING ELEVATION

ELAPSED TIME (sec)	WATER LEVEL (ft)	WATER ELEV. (ft AMSL)	DRAWDOWN (ft)
5	3.34	650.04	1.46
30	3.28	650.10	1.40
60	3.24	650.14	1.36
90	3.20	650.18	1.32
120	3.17	650.21	1.29
180	3.11	650.27	1.23
240	3.06	650.32	1.18
300	3.01	650.37	1.13
600	2.82	650.56	0.94
900	2.68	650.70	0.80
1200	2.54	650.84	0.66
1500	2.45	650.93	0.57
1800	2.36	651.02	0.48
2400	2.25	651.13	0.37
3000	2.12	651.26	0.24
3600	2.09	651.29	0.21

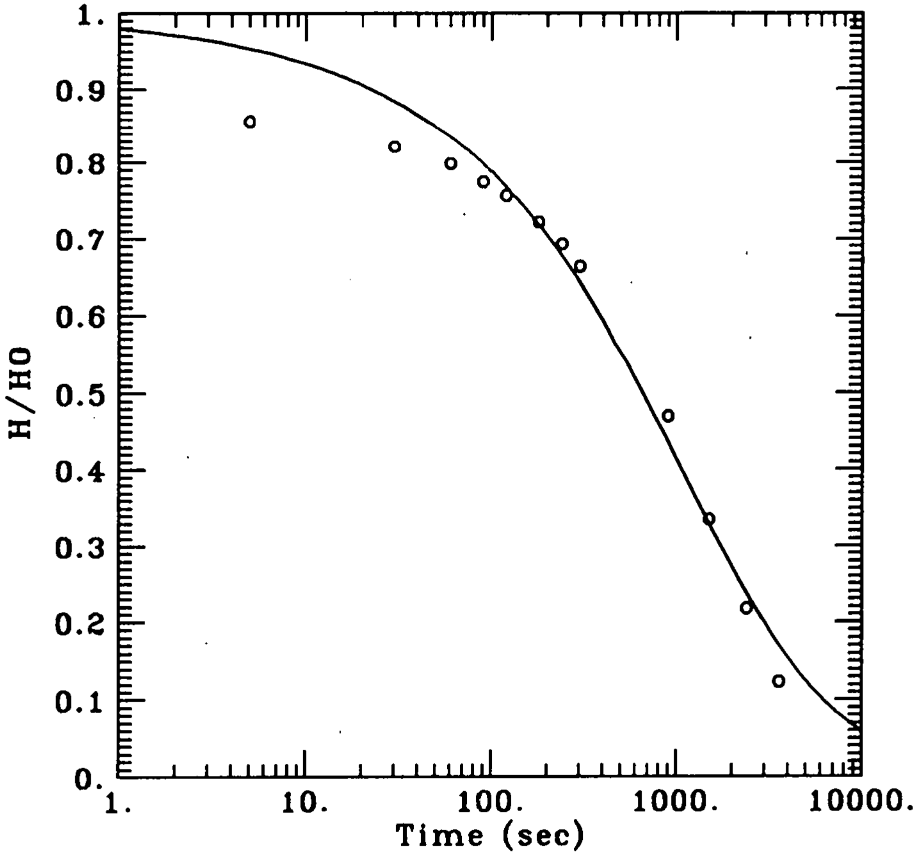
Conestoga Rovers & Associates

Client: **Leica Inc.**

Project No.: **3967**

Location: **Cheektowaga, New York**

RISING HEAD TEST @ MW-14



DATA SET:
mw14.dat
09/13/94

AQUIFER TYPE:
Confined
SOLUTION METHOD:
Cooper et al.
TEST DATE:
03/23/94
TEST WELL:
MW-14
OBS. WELL:
MW-14

ESTIMATED PARAMETERS:
T = 3.6263E-06 ft^2/sec
S = 0.009623

TEST DATA:
H0 = 1.703 ft
rc = 0.083 ft
rw = 0.333 ft

Job No: 3967 MW15 Date: 09/13/94 Page: 1/1

Client	: Leica Inc.
Site Location	: Cheektowaga, New York
Project No	: 3967
Test Type	: RISING HEAD TEST
Observation Well	: MW-15
Start Date/Time	: 03/23/94 | 00:00:00
Reference Description	: Top of Casing Elevation
Reference Elevation	: 658.35 ft AMSL
Static Water Level	: 5.32 ft
Water level measured from	: TOP OF CASING ELEVATION

ELAPSED TIME (sec)	WATER LEVEL (ft)	WATER ELEV. (ft AMSL)	DRAWDOWN (ft)
5	6.51	651.84	1.19
30	6.41	651.94	1.09
60	6.36	651.99	1.04
90	6.32	652.03	1.00
120	6.30	652.05	0.98
150	6.27	652.08	0.95
180	6.25	652.10	0.93
210	6.23	652.12	0.91
240	6.21	652.14	0.89
300	6.17	652.18	0.85
360	6.13	652.22	0.81
420	6.08	652.27	0.76
480	6.02	652.33	0.70
540	5.96	652.39	0.64
600	5.92	652.43	0.60
900	5.73	652.62	0.41
1200	5.60	652.75	0.28
1500	5.51	652.84	0.19
1800	5.45	652.90	0.13
2100	5.41	652.94	0.09

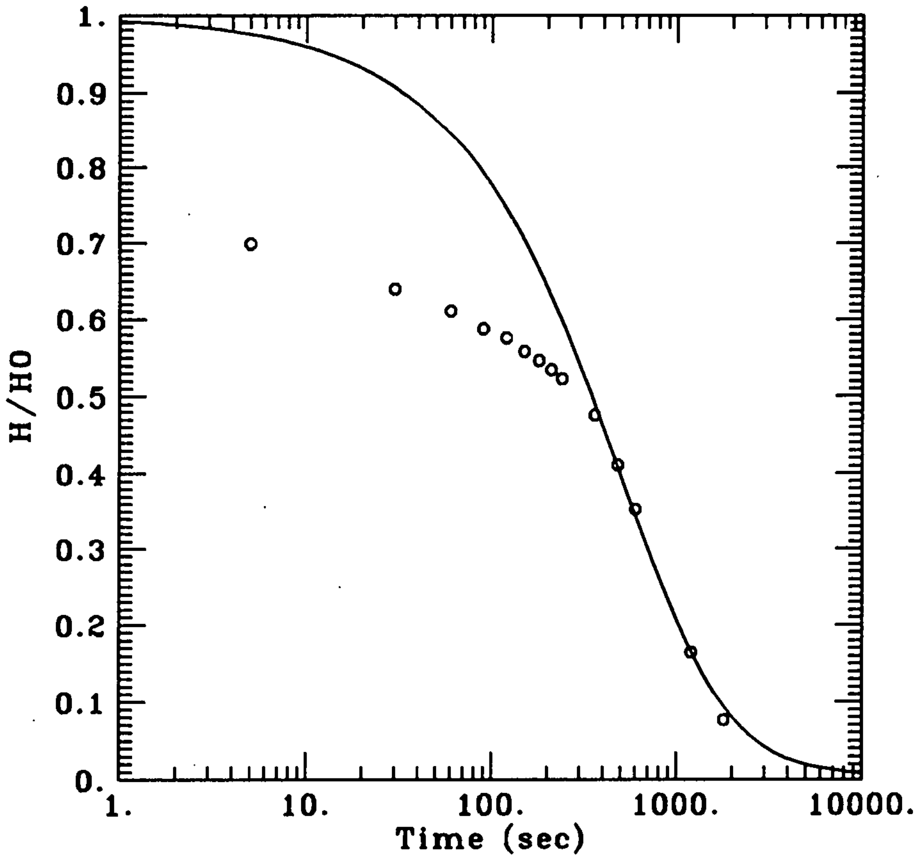
Conestoga Rovers & Associates

Client: **Leica Inc.**

Project No.: **3967**

Location: **Cheektowaga, New York**

RISING HEAD TEST @ MW-15



DATA SET:
mw15.dat
09/13/94

AQUIFER TYPE:
Confined
SOLUTION METHOD:
Cooper et al.
TEST DATE:
03/23/94
TEST WELL:
MW-15
OBS. WELL:
MW-15

ESTIMATED PARAMETERS:
T = 2.4054E-05 ft^2/sec
S = 0.0001

TEST DATA:
H0 = 1.703 ft
rc = 0.083 ft
rw = 0.333 ft

Client : Leica Inc.
Site Location : Cheektowaga, New York
Project No : 3967
Test Type : RISING HEAD TEST
Observation Well : MW-19
Start Date/Time : 03/23/94 | 00:00:00
Reference Description : Top of Casing Elevation
Reference Elevation : 660.84 ft AMSL

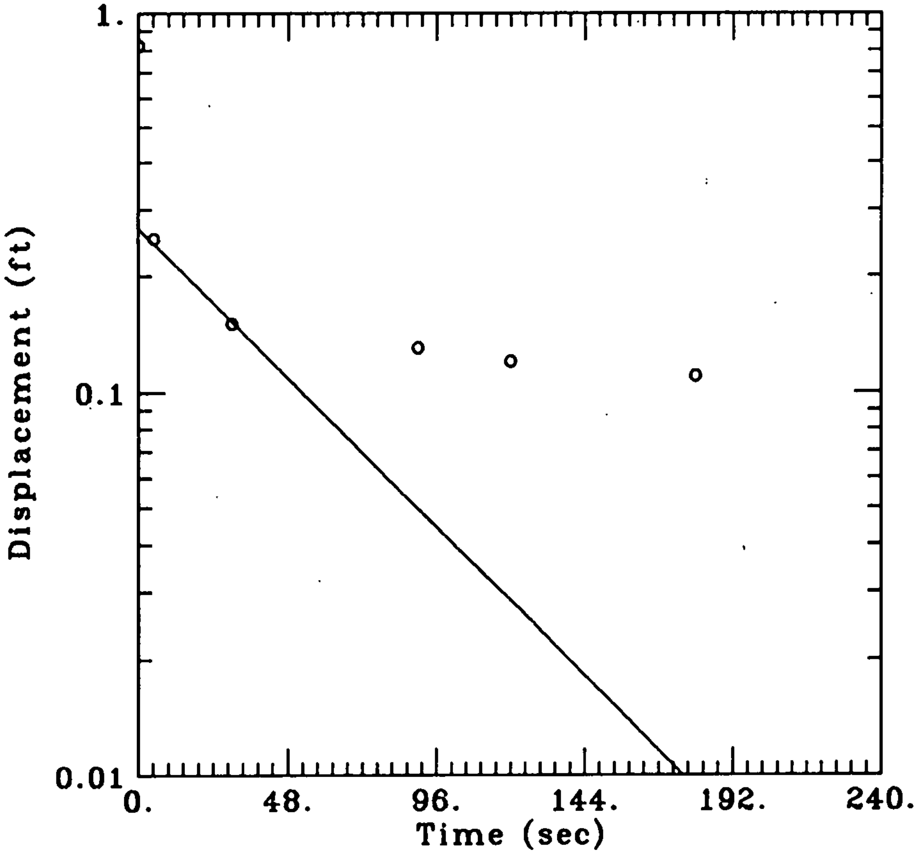
Static Water Level : 11.95 ft

Water level measured from : TOP OF CASING ELEVATION

ELAPSED TIME (sec)	WATER LEVEL (ft)	WATER ELEV. (ft AMSL)	DRAWDOWN (ft)
5	12.20	648.64	0.25
30	12.10	648.74	0.15
60	12.08	648.76	0.13
90	12.08	648.76	0.13
120	12.07	648.77	0.12
150	12.06	648.78	0.11
180	12.06	648.78	0.11
240	12.04	648.80	0.09

Conestoga Rovers & Associates	Client: **Leica Inc.**
Project No.: **3967**	Location: **Cheektowaga, New York**

RISING HEAD TEST @ MW-19 (1)



DATA SET:
mw19_1.dat
09/13/94

AQUIFER TYPE:
Unconfined
SOLUTION METHOD:
Bouwer-Rice
TEST DATE:
03/23/94
TEST WELL:
MW-19
OBS. WELL:
MW-19

ESTIMATED PARAMETERS:
K = 0.0001022 ft/sec
y0 = 0.266 ft

TEST DATA:
H0 = 0.823 ft
rc = 0.195 ft
rw = 0.333 ft
L = 4.5 ft
b = 1.75 ft
H = 1.75 ft

Job No: 3967 MW19_2 Date: 09/13/94 Page: 1/1

Client : Leica Inc.
Site Location : Cheektowaga, New York
Project No : 3967
Test Type : RISING HEAD TEST
Observation Well : MW-19
Start Date/Time : 03/23/94 | 00:00:00
Reference Description : Top of Casing Elevation
Reference Elevation : 660.84 ft AMSL

Static Water Level : 12.00 ft

Water level measured from : TOP OF CASING ELEVATION

ELAPSED TIME (sec)	WATER LEVEL (ft)	WATER ELEV. (ft AMSL)	DRAWDOWN (ft)
5	12.28	648.56	0.28
30	12.24	648.60	0.24
60	12.20	648.64	0.20
90	12.18	648.66	0.18
120	12.18	648.66	0.18
150	12.17	648.67	0.17
180	12.17	648.67	0.17
240	12.16	648.68	0.16
300	12.15	648.69	0.15
360	12.14	648.70	0.14
420	12.13	648.71	0.13

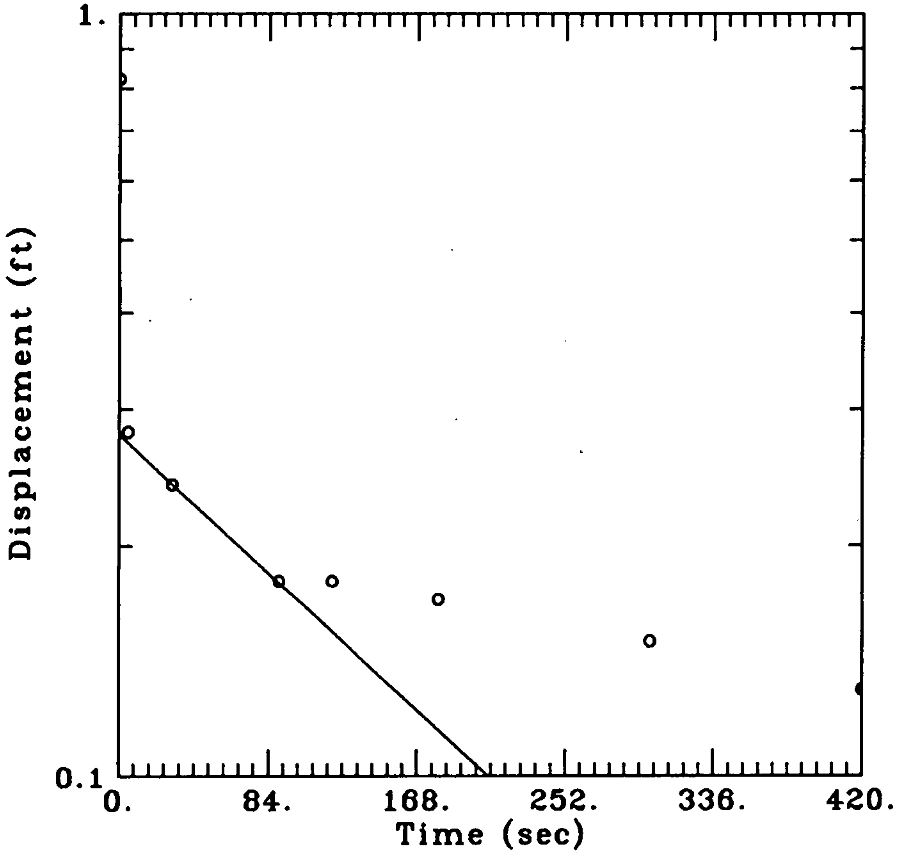
Conestoga Rovers & Associates

Client: **Leica Inc.**

Project No.: **3967**

Location: **Cheektowaga, New York**

RISING HEAD TEST @ MW-19 (2)



DATA SET:
mw19_2.dat
09/13/94

AQUIFER TYPE:
Unconfined
SOLUTION METHOD:
Bouwer-Rice
TEST DATE:
03/23/94
TEST WELL:
MW-19
OBS. WELL:
MW-19

ESTIMATED PARAMETERS:
K = 2.6445E-05 ft/sec
y0 = 0.2781 ft

TEST DATA:
H0 = 0.823 ft
rc = 0.195 ft
rw = 0.333 ft
L = 4.5 ft
b = 1.7 ft
H = 1.7 ft

Job No: 3967 MW22 Date: 09/13/94 Page: 1/1

Client : Leica Inc.
Site Location : Cheektowaga, New York
Project No : 3967
Test Type : RISING HEAD TEST
Observation Well : MW-22
Start Date/Time : 03/23/94 | 00:00:00
Reference Description : Top of Casing Elevation
Reference Elevation : 652.51 ft AMSL

Static Water Level : 9.30 ft

Water level measured from : TOP OF CASING ELEVATION

ELAPSED TIME (sec)	WATER LEVEL (ft)	WATER ELEV. (ft AMSL)	DRAWDOWN (ft)
5	9.70	642.81	0.40
30	9.62	642.89	0.32
60	9.62	642.89	0.32
120	9.62	642.89	0.32
180	9.60	642.91	0.30
240	9.60	642.91	0.30
300	9.60	642.91	0.30
360	9.58	642.93	0.28
420	9.58	642.93	0.28
480	9.57	642.94	0.27
540	9.56	642.95	0.26
600	9.55	642.96	0.25
900	9.51	643.00	0.21
1200	9.47	643.04	0.17

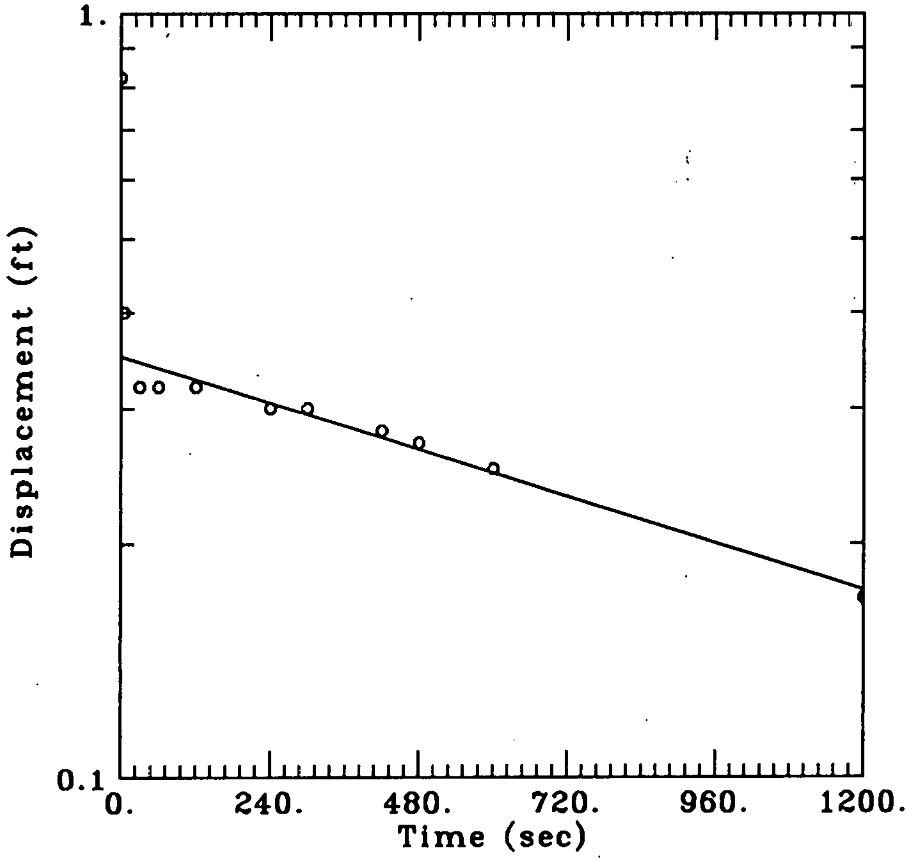
Conestoga Rovers & Associates

Client: **Leica Inc.**

Project No.: **3967**

Location: **Cheektowaga, New York**

RISING HEAD TEST @ MW-22



DATA SET:
mw22.dat
09/13/94

AQUIFER TYPE:
Unconfined
SOLUTION METHOD:
Bouwer-Rice
TEST DATE:
03/23/94
TEST WELL:
MW-22
OBS. WELL:
MW-22

ESTIMATED PARAMETERS:
K = 2.5533E-06 ft/sec
y0 = 0.3502 ft

TEST DATA:
H0 = 0.823 ft
rc = 0.195 ft
rw = 0.333 ft
L = 5. ft
b = 1.4 ft
H = 1.4 ft

Client : Leica Inc.
Site Location : Cheektowaga, New York
Project No : 3967
Test Type : RISING HEAD TEST
Observation Well : MW-23
Start Date/Time : 03/23/94 | 00:00:00
Reference Description : Top of Casing Elevation
Reference Elevation : 656.18 ft AMSL

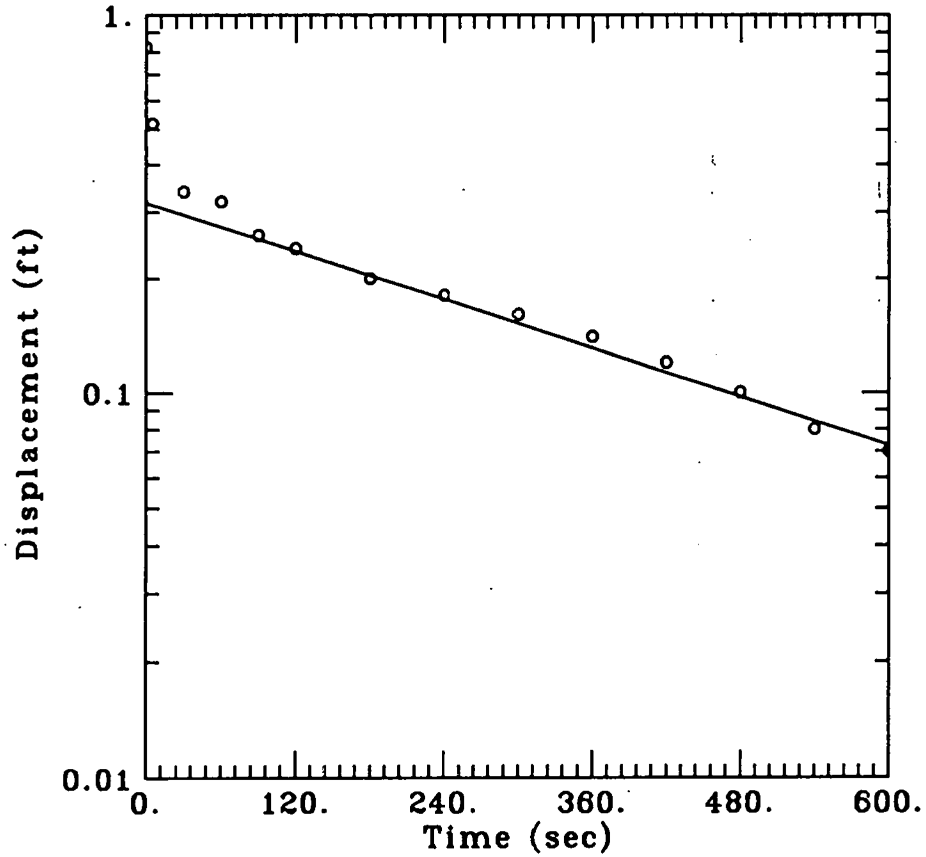
Static Water Level : 9.98 ft

Water level measured from : TOP OF CASING ELEVATION

ELAPSED TIME (sec)	WATER LEVEL (ft)	WATER ELEV. (ft AMSL)	DRAWDOWN (ft)
5	10.50	645.68	0.52
30	10.32	645.86	0.34
60	10.30	645.88	0.32
90	10.24	645.94	0.26
120	10.22	645.96	0.24
180	10.18	646.00	0.20
240	10.16	646.02	0.18
300	10.14	646.04	0.16
360	10.12	646.06	0.14
420	10.10	646.08	0.12
480	10.08	646.10	0.10
540	10.06	646.12	0.08
600	10.05	646.13	0.07

Conestoga Rovers & Associates	Client: **Leica Inc.**
Project No.: 3967	Location: **Cheektowaga, New York**

RISING HEAD TEST @ MW-23



DATA SET:
mw23.dat
09/13/94

AQUIFER TYPE:
Unconfined
SOLUTION METHOD:
Bouwer-Rice
TEST DATE:
03/23/94
TEST WELL:
MW-23
OBS. WELL:
MW-23

ESTIMATED PARAMETERS:
K = 2.2606E-05 ft/sec
y0 = 0.3169 ft

TEST DATA:
H0 = 0.823 ft
rc = 0.195 ft
rw = 0.333 ft
L = 4.2 ft
b = 6.02 ft
H = 6.02 ft

Job No: 3967 MW1A_1 Date: 09/13/94 Page: 1/1

Client : Leica Inc.
Site Location : Cheektowaga, New York
Project No : 3967
Test Type : RISING HEAD TEST
Observation Well : MW-1A
Start Date/Time : 03/23/94 | 00:00:00
Reference Description : Top of Casing Elevation
Reference Elevation : 663.48 ft AMSL

Static Water Level : 20.14 ft

Water level measured from : TOP OF CASING ELEVATION

ELAPSED TIME (sec)	WATER LEVEL (ft)	WATER ELEV. (ft AMSL)	DRAWDOWN (ft)
5	20.64	642.84	0.50
30	20.58	642.90	0.44
60	20.51	642.97	0.37
90	20.37	643.11	0.23
120	20.16	643.32	0.02
180	20.15	643.33	0.01

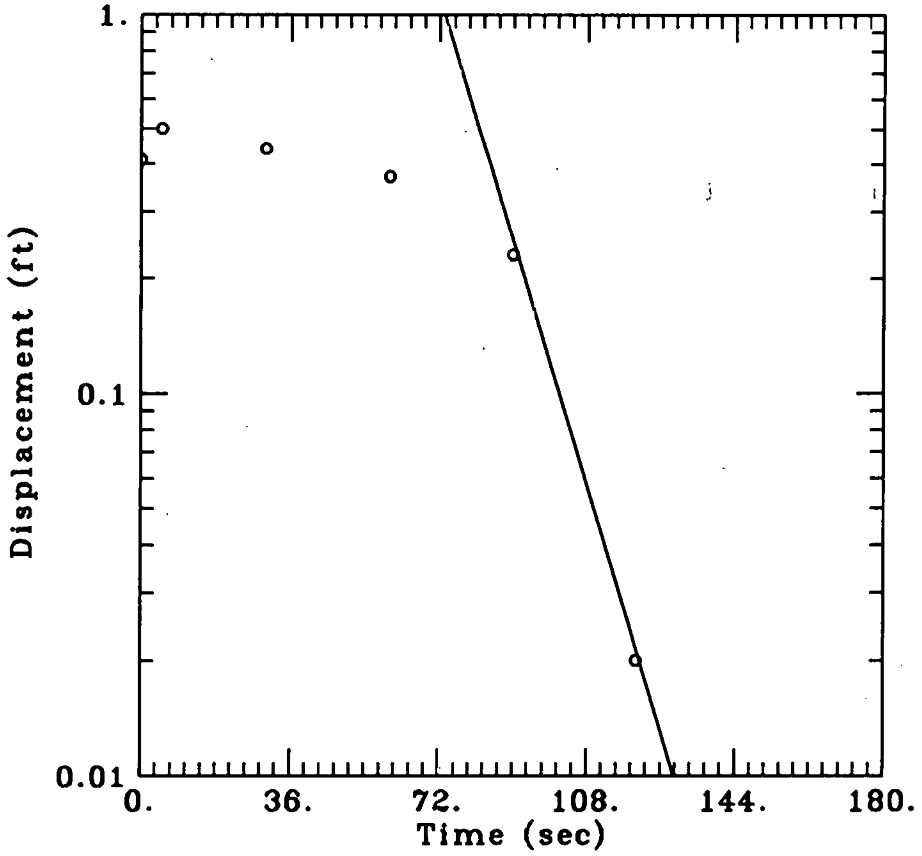
Conestoga Rovers & Associates

Client: **Leica Inc.**

Project No.: **3967**

Location: **Cheektowaga, New York**

RISING HEAD TEST @ MW-1A (1)



DATA SET:
mw1a_1.dat
09/13/94

AQUIFER TYPE:
Unconfined
SOLUTION METHOD:
Bouwer-Rice
TEST DATE:
03/23/94
TEST WELL:
MW-1A
OBS. WELL:
MW-1A

ESTIMATED PARAMETERS:
K = 0.0001801 ft/sec
y0 = 402.3 ft

TEST DATA:
H0 = 0.41 ft
rc = 0.167 ft
rw = 0.167 ft
L = 25.1 ft
b = 28.16 ft
H = 28.16 ft

Client : Leica Inc.
Site Location : Cheektowaga, New York
Project No : 3967
Test Type : RISING HEAD TEST
Observation Well : MW-1A
Start Date/Time : 03/23/94 | 00:00:00
Reference Description : Top of Casing Elevation
Reference Elevation : 663.48 ft AMSL

Static Water Level : 20.14 ft

Water level measured from : TOP OF CASING ELEVATION

ELAPSED TIME (sec)	WATER LEVEL (ft)	WATER ELEV. (ft AMSL)	DRAWDOWN (ft)
5	20.60	642.88	0.46
30	20.50	642.98	0.36
60	20.35	643.13	0.21
90	20.20	643.28	0.06
120	20.16	643.32	0.02
180	20.15	643.33	0.01
240	20.15	643.33	0.01

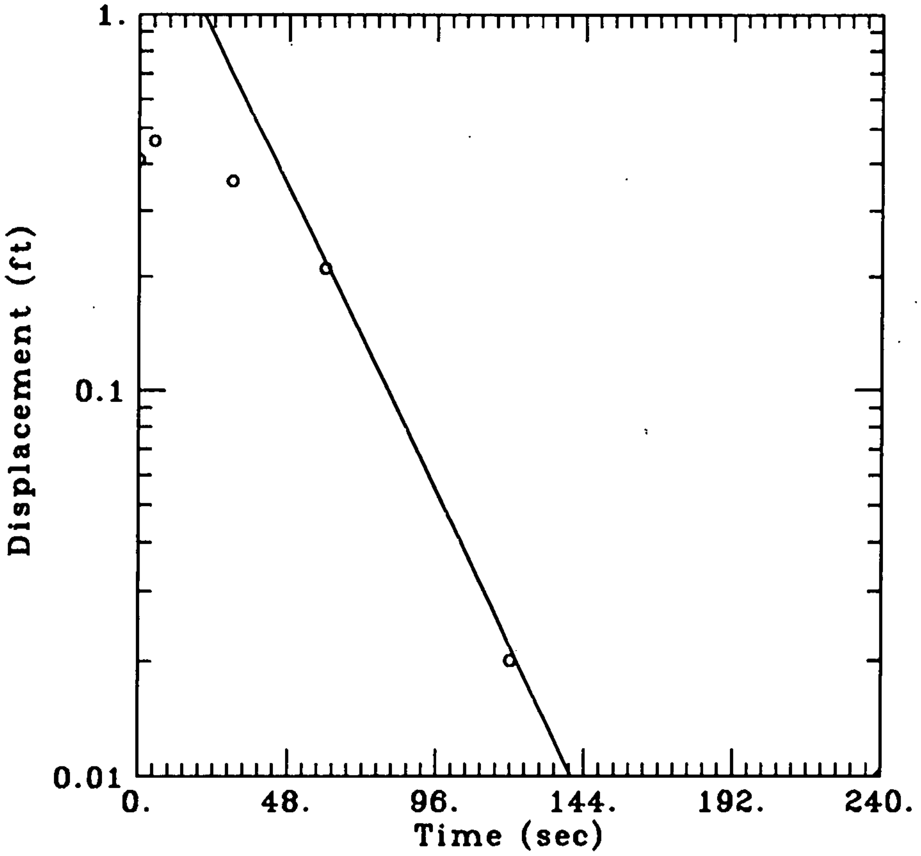
Conestoga Rovers & Associates

Client: **Leica Inc.**

Project No.: **3967**

Location: **Cheektowaga, New York**

RISING HEAD TEST @ MW-1A (2)



DATA SET:
mw1a_2.dat
09/13/94

AQUIFER TYPE:
Unconfined

SOLUTION METHOD:
Bouwer-Rice

TEST DATE:
03/23/94

TEST WELL:
MW-1A

OBS. WELL:
MW-1A

ESTIMATED PARAMETERS:
K = 8.4863E-05 ft/sec
y0 = 2.219 ft

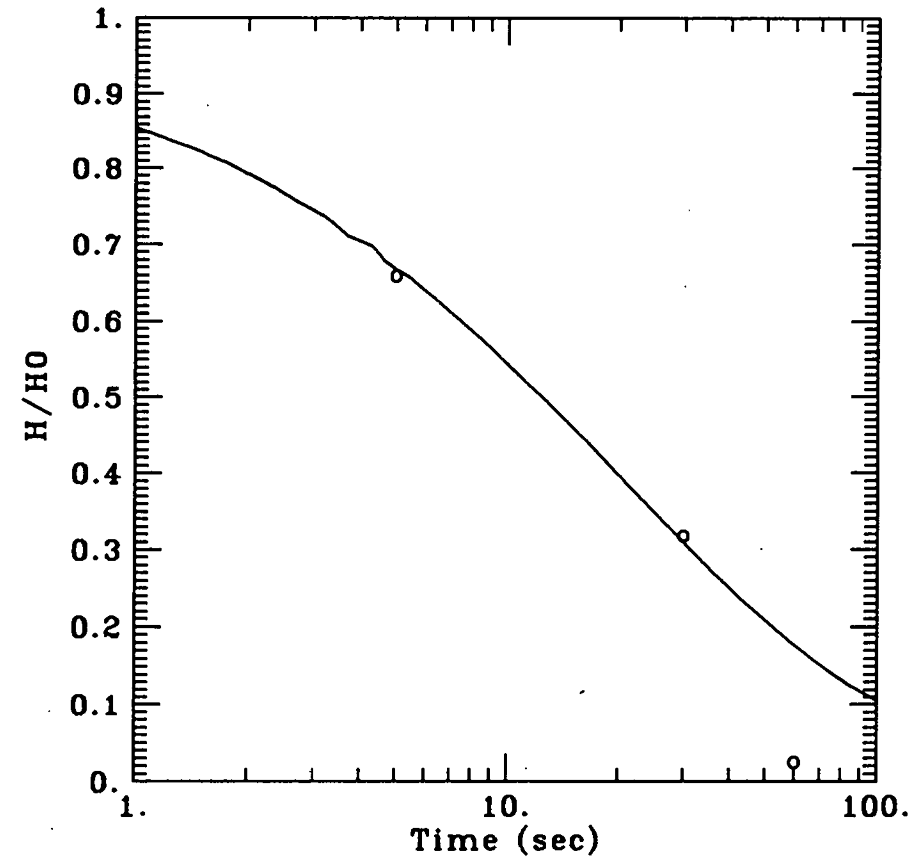
TEST DATA:
H0 = 0.41 ft
rc = 0.167 ft
rw = 0.167 ft
L = 25.1 ft
b = 28.16 ft
H = 28.16 ft

Client	: Leica Inc.
Site Location	: Cheektowaga, New York
Project No	: 3967
Test Type	: RISING HEAD TEST
Observation Well	: MW-2A
Start Date/Time	: 03/23/94 | 00:00:00
Reference Description	: Top of Casing Elevation
Reference Elevation	: 657.02 ft AMSL
Static Water Level	: 6.68 ft
Water level measured from	: TOP OF CASING ELEVATION

ELAPSED TIME (sec)	WATER LEVEL (ft)	WATER ELEV. (ft AMSL)	DRAWDOWN (ft)
5	6.95	650.07	0.27
30	6.81	650.21	0.13
60	6.69	650.33	0.01
90	6.68	650.34	0.00

Conestoga Rovers & Associates	Client: **Leica Inc.**
Project No.: **3967**	Location: **Cheektowaga, New York**

RISING HEAD TEST @ MW-2A (1)



DATA SET:
mw2a_1.dat
09/13/94

AQUIFER TYPE:
Confined
SOLUTION METHOD:
Cooper et al.
TEST DATE:
03/23/94
TEST WELL:
MW-2A
OBS. WELL:
MW-2A

ESTIMATED PARAMETERS:
$T = 0.000941\ ft^2/sec$
$S = 0.1$

TEST DATA:
$H0 = 0.41$ ft
$rc = 0.167$ ft
$rw = 0.167$ ft

Client : Leica Inc.
Site Location : Cheektowaga, New York
Project No : 3967
Test Type : RISING HEAD TEST
Observation Well : MW-2A
Start Date/Time : 03/23/94 | 00:00:00
Reference Description : Top of Casing Elevation
Reference Elevation : 657.02 ft AMSL

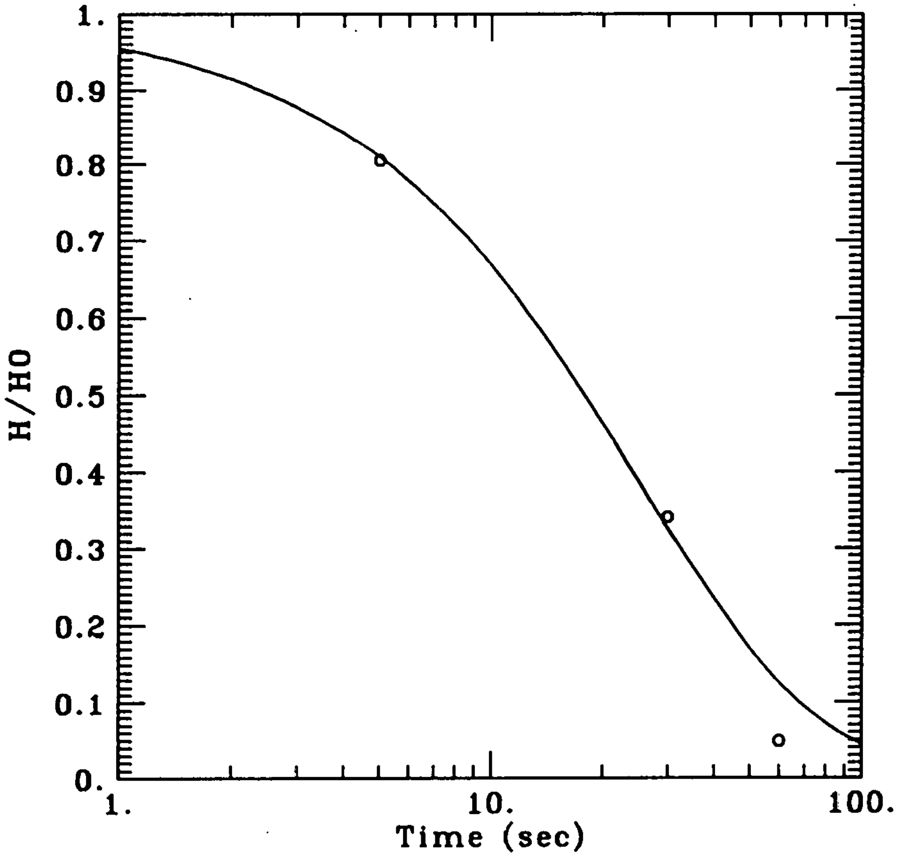
Static Water Level : 6.68 ft

Water level measured from : TOP OF CASING ELEVATION

ELAPSED TIME (sec)	WATER LEVEL (ft)	WATER ELEV. (ft AMSL)	DRAWDOWN (ft)
5	7.01	650.01	0.33
30	6.82	650.20	0.14
60	6.70	650.32	0.02
90	6.68	650.34	0.00

Conestoga Rovers & Associates	Client: **Leica Inc.**
Project No.: **3967**	Location: **Cheektowaga, New York**

RISING HEAD TEST @ MW-2A (2)



DATA SET:
mw2a_2.dat
09/13/94

AQUIFER TYPE:
Confined
SOLUTION METHOD:
Cooper et al.
TEST DATE:
03/23/94
TEST WELL:
MW-2A
OBS. WELL:
MW-2A

ESTIMATED PARAMETERS:
$T = 0.005396\ ft^2/sec$
$S = 1.E-08$

TEST DATA:
HO = 0.41 ft
rc = 0.167 ft
rw = 0.167 ft

Client : Leica Inc.
Site Location : Cheektowaga, New York
Project No : 3967
Test Type : RISING HEAD TEST
Observation Well : MW-2A
Start Date/Time : 03/23/94 | 00:00:00
Reference Description : Top of Casing Elevation
Reference Elevation : 657.02 ft AMSL

Static Water Level : 6.68 ft

Water level measured from : TOP OF CASING ELEVATION

ELAPSED TIME (sec)	WATER LEVEL (ft)	WATER ELEV. (ft AMSL)	DRAWDOWN (ft)
5	7.04	649.98	0.36
15	6.95	650.07	0.27
30	6.84	650.18	0.16
45	6.75	650.27	0.07
60	6.71	650.31	0.03
75	6.69	650.33	0.01
90	6.68	650.34	0.00

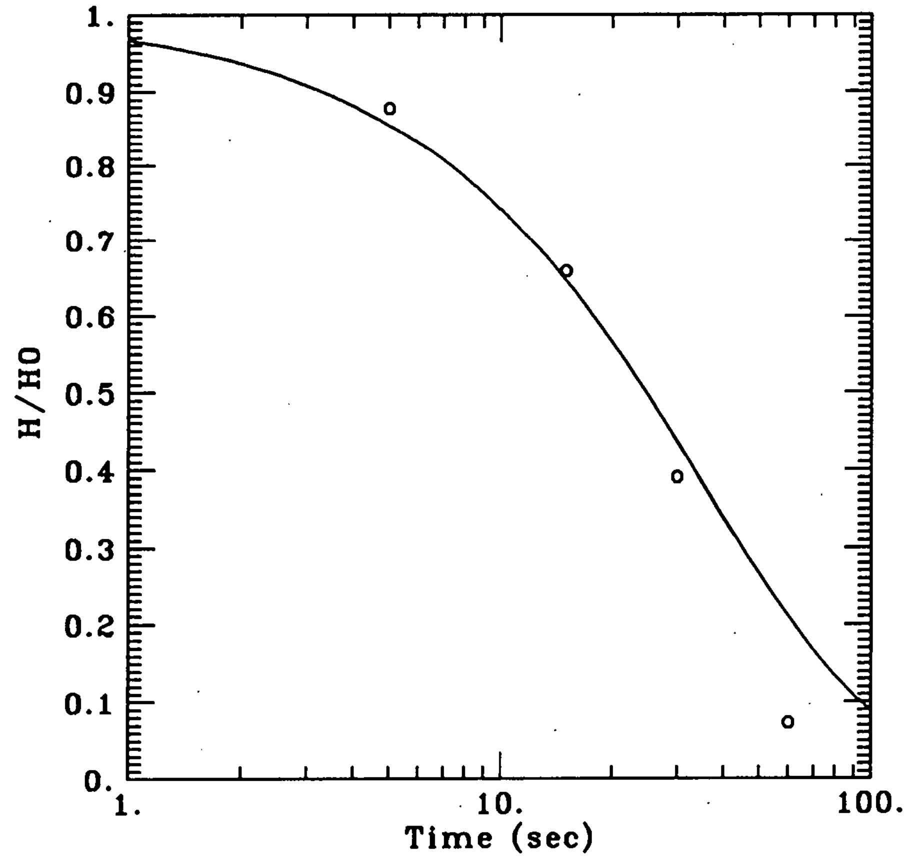
Conestoga Rovers & Associates

Client: **Leica Inc.**

Project No.: **3967**

Location: **Cheektowaga, New York**

RISING HEAD TEST @ MW-2A (3)



DATA SET:
mw2a_3.dat
09/13/94

AQUIFER TYPE:
Confined
SOLUTION METHOD:
Cooper et al.
TEST DATE:
03/23/94
TEST WELL:
MW-2A
OBS. WELL:
MW-2A

ESTIMATED PARAMETERS:
T = 0.003907 ft^2/sec
S = 1.E-08

TEST DATA:
H0 = 0.41 ft
rc = 0.167 ft
rw = 0.167 ft

Client : Leica Inc.
Site Location : Cheektowaga, New York
Project No : 3967
Test Type : RISING HEAD TEST
Observation Well : MW-5A
Start Date/Time : 03/23/94 | 00:00:00
Reference Description : Ground Surface Elevation
Reference Elevation : 654.84 ft AMSL

Static Water Level : 5.27 ft

Water level measured from : GROUND SURFACE ELEVATION

ELAPSED TIME (sec)	WATER LEVEL (ft)	WATER ELEV. (ft AMSL)	DRAWDOWN (ft)
5	5.75	649.09	0.48
30	5.68	649.16	0.41
60	5.67	649.17	0.40
90	5.66	649.18	0.39
120	5.65	649.19	0.38
150	5.64	649.20	0.37
180	5.63	649.21	0.36
240	5.61	649.23	0.34
300	5.60	649.24	0.33
360	5.58	649.26	0.31
420	5.57	649.27	0.30
480	5.56	649.28	0.29
540	5.55	649.29	0.28
600	5.50	649.34	0.23
900	5.47	649.37	0.20
1200	5.45	649.39	0.18
1800	5.37	649.47	0.10
2400	5.32	649.52	0.05

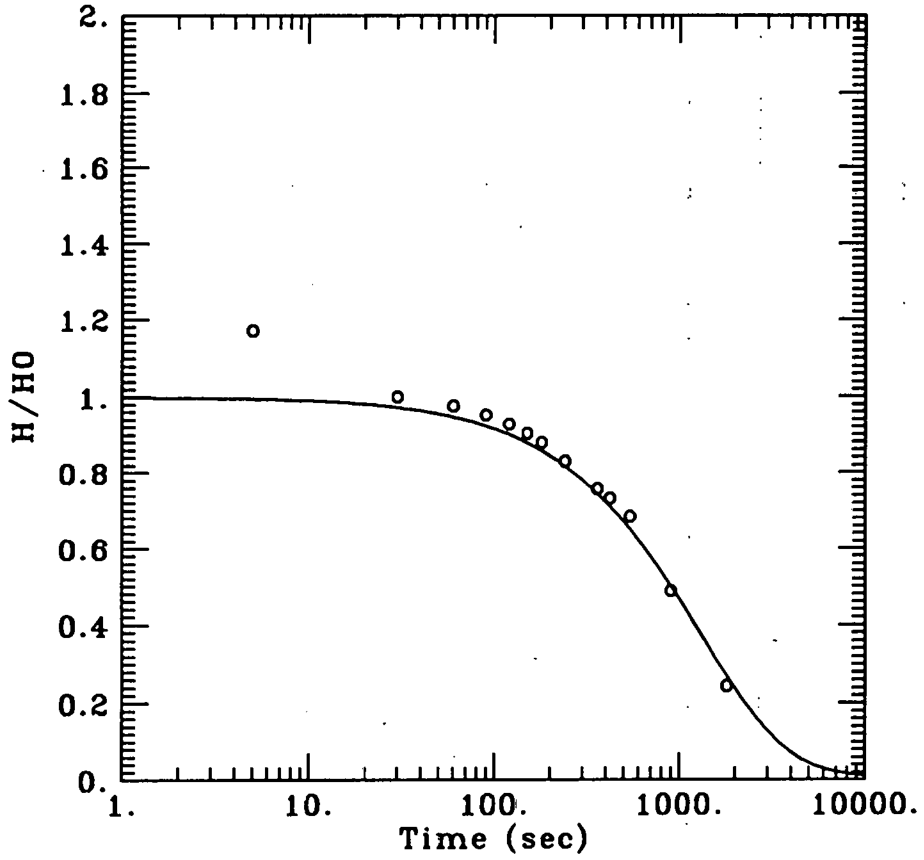
Conestoga Rovers & Associates

Client: **Leica Inc.**

Project No.: **3967**

Location: **Cheektowaga, New York**

RISING HEAD TEST @ MW-5A



DATA SET:
mw5a.dat
09/13/94

AQUIFER TYPE:
Confined
SOLUTION METHOD:
Cooper et al.
TEST DATE:
03/23/94
TEST WELL:
MW-5A
OBS. WELL:
MW-5A

ESTIMATED PARAMETERS:
$T = 0.0001071$ ft^2/sec
$S = 1.E-08$

TEST DATA:
$H0 = 0.41$ ft
$rc = 0.167$ ft
$rw = 0.167$ ft

Client : Leica Inc.
Site Location : Cheektowaga, New York
Project No : 3967
Test Type : RISING HEAD TEST
Observation Well : MW-6A
Start Date/Time : 03/23/94 | 00:00:00
Reference Description : Top of Casing Elevation
Reference Elevation : 659.38 ft AMSL

Static Water Level : 16.06 ft

Water level measured from : TOP OF CASING ELEVATION

ELAPSED TIME (sec)	WATER LEVEL (ft)	WATER ELEV. (ft AMSL)	DRAWDOWN (ft)
5	16.25	643.13	0.19
30	16.15	643.23	0.09
60	16.10	643.28	0.04
90	16.08	643.30	0.02
120	16.08	643.30	0.02
150	16.07	643.31	0.01
180	16.06	643.32	0.00
240	16.06	643.32	0.00

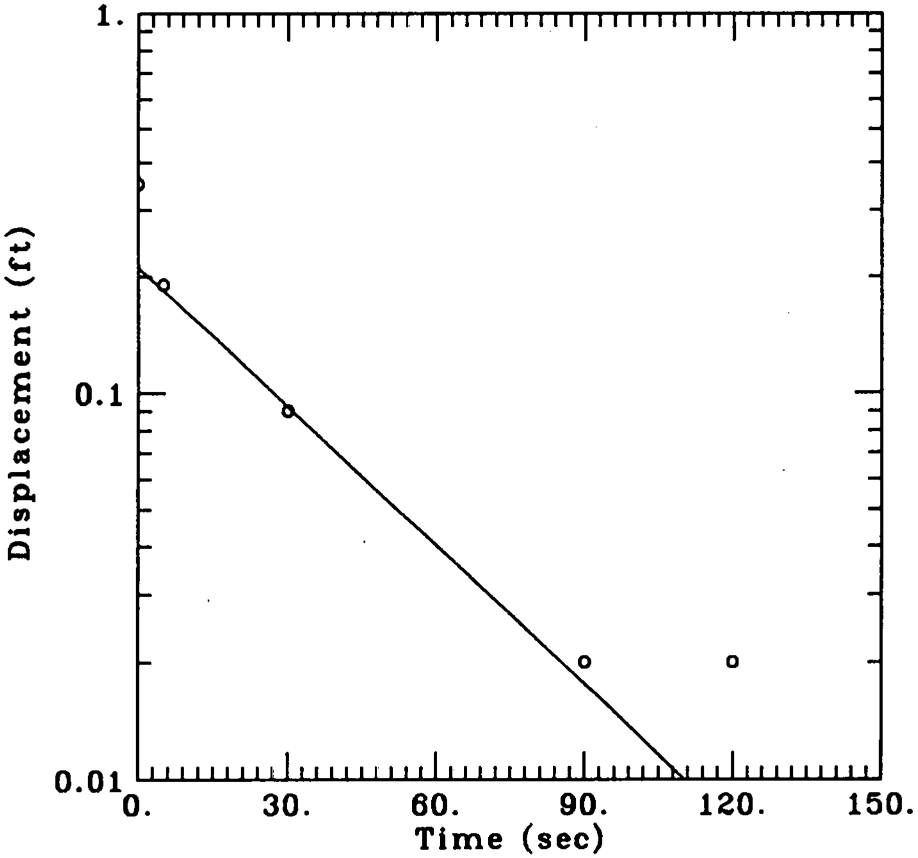
Conestoga Rovers & Associates

Client: **Leica Inc.**

Project No.: **3967**

Location: **Cheektowaga, New York**

RISING HEAD TEST @ MW-6A



DATA SET:
mw6a.dat
09/13/94

AQUIFER TYPE:
Unconfined
SOLUTION METHOD:
Bouwer-Rice
TEST DATE:
03/23/94
TEST WELL:
MW-6A
OBS. WELL:
MW-6A

ESTIMATED PARAMETERS:
K = 7.2277E-05 ft/sec
y0 = 0.2112 ft

TEST DATA:
H0 = 0.351 ft
rc = 0.167 ft
rw = 0.167 ft
L = 21.4 ft
b = 32.6 ft
H = 32.6 ft

Client : Leica Inc.
Site Location : Cheektowaga, New York
Project No : 3967
Test Type : RISING HEAD TEST
Observation Well : MW-13A
Start Date/Time : 03/23/94 | 00:00:00
Reference Description : Top of Casing Elevation
Reference Elevation : 655.13 ft AMSL

Static Water Level : 6.07 ft

Water level measured from : TOP OF CASING ELEVATION

ELAPSED TIME (sec)	WATER LEVEL (ft)	WATER ELEV. (ft AMSL)	DRAWDOWN (ft)
5	6.46	648.67	0.39
30	6.38	648.75	0.31
60	6.33	648.80	0.26
90	6.31	648.82	0.24
120	6.28	648.85	0.21
180	6.25	648.88	0.18
240	6.23	648.90	0.16
300	6.21	648.92	0.14
420	6.17	648.96	0.10
540	6.15	648.98	0.08
660	6.12	649.01	0.05
780	6.09	649.04	0.02

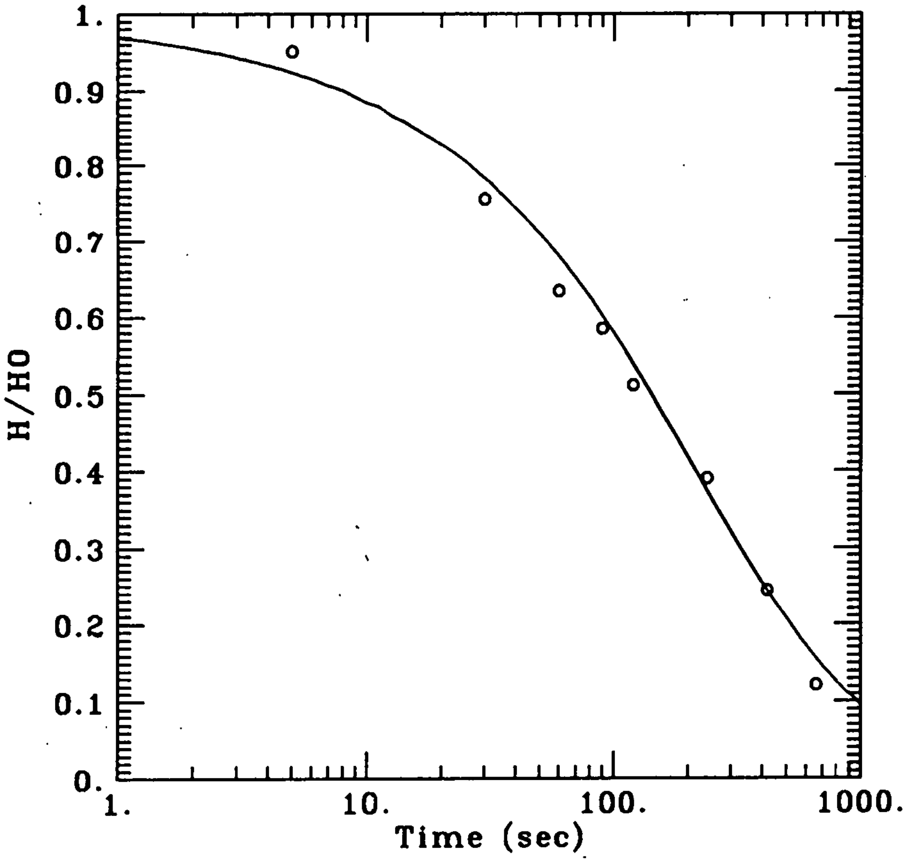
Conestoga Rovers & Associates

Client: **Leica Inc.**

Project No.: 3967

Location: **Cheektowaga, New York**

RISING HEAD TEST @ MW-13A



DATA SET:
mw13a.dat
09/13/94

AQUIFER TYPE:
Confined
SOLUTION METHOD:
Cooper et al.
TEST DATE:
03/23/94
TEST WELL:
MW-13A
OBS. WELL:
MW-13A

ESTIMATED PARAMETERS:
T = 0.0001211 ft^2/sec
S = 0.0338

TEST DATA:
HO = 0.41 ft
rc = 0.167 ft
rw = 0.167 ft

Job No: 3967 MW14A_1 Date: 09/13/94 Page: 1/1

Client : Leica Inc.
Site Location : Cheektowaga, New York
Project No : 3967
Test Type : RISING HEAD TEST
Observation Well : MW-14A
Start Date/Time : 03/23/94 | 00:00:00
Reference Description : Top of Casing Elevation
Reference Elevation : 653.70 ft AMSL

Static Water Level : 5.01 ft

Water level measured from : TOP OF CASING ELEVATION

ELAPSED TIME (sec)	WATER LEVEL (ft)	WATER ELEV. (ft AMSL)	DRAWDOWN (ft)
5	5.24	648.46	0.23
30	5.02	648.68	0.01
60	5.02	648.68	0.01

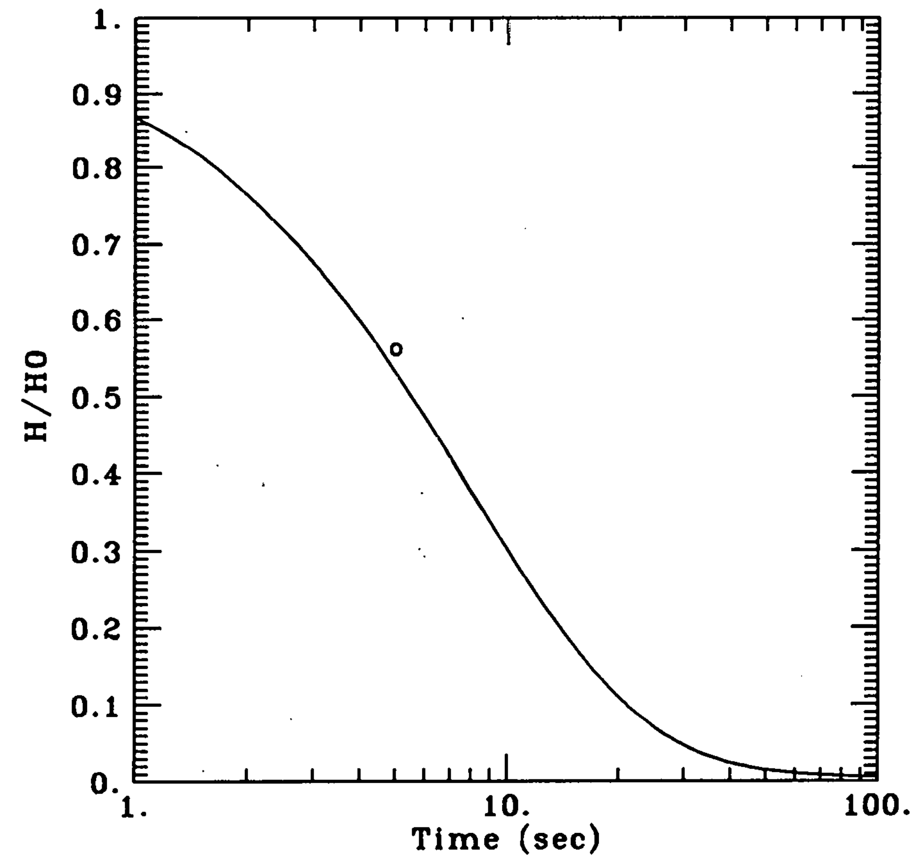
Conestoga Rovers & Associates

Client: **Leica Inc.**

Project No.: **3967**

Location: **Cheektowaga, New York**

RISING HEAD TEST @ MW-14A (1)



DATA SET:
mw14a_1.dat
09/13/94

AQUIFER TYPE:
Confined
SOLUTION METHOD:
Cooper et al.
TEST DATE:
03/23/94
TEST WELL:
MW-14A
OBS. WELL:
MW-14A

ESTIMATED PARAMETERS:
T = 0.01748 ft^2/sec
S = 1.E-08

TEST DATA:
HO = 0.41 ft
rc = 0.167 ft
rw = 0.167 ft

Client	: Leica Inc.
Site Location	: Cheektowaga, New York
Project No	: 3967
Test Type	: RISING HEAD TEST
Observation Well	: MW-14A
Start Date/Time	: 03/23/94 | 00:00:00
Reference Description	: Top of Casing Elevation
Reference Elevation	: 653.70 ft AMSL
Static Water Level	: 5.01 ft
Water level measured from	: TOP OF CASING ELEVATION

ELAPSED TIME (sec)	WATER LEVEL (ft)	WATER ELEV. (ft AMSL)	DRAWDOWN (ft)
5	5.26	648.44	0.25
15	5.05	648.65	0.04
30	5.03	648.67	0.02
60	5.02	648.68	0.01

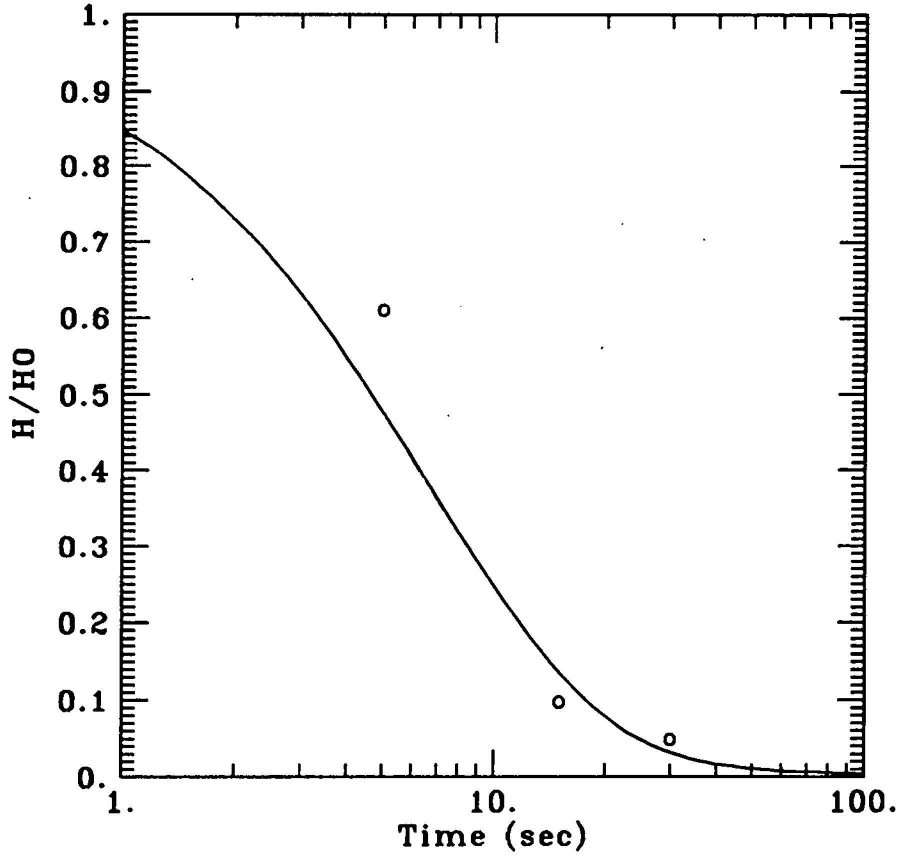
Conestoga Rovers & Associates

Client: **Leica Inc.**

Project No.: **3967**

Location: **Cheektowaga, New York**

RISING HEAD TEST @ MW14-A (2)



DATA SET:
mw14a_2.dat
09/13/94

AQUIFER TYPE:
Confined
SOLUTION METHOD:
Cooper et al.
TEST DATE:
03/23/94
TEST WELL:
MW-14A
OBS. WELL:
MW-14A

ESTIMATED PARAMETERS:
T = 0.02069 ft^2/sec
S = 1.E-08

TEST DATA:
HO = 0.41 ft
rc = 0.167 ft
rw = 0.167 ft

Client : Leica Inc.
Site Location : Cheektowaga, New York
Project No : 3967
Test Type : RISING HEAD TEST
Observation Well : MW-15A
Start Date/Time : 03/23/94 | 00:00:00
Reference Description : Top of Casing Elevation
Reference Elevation : 658.51 ft AMSL

Static Water Level : 9.20 ft

Water level measured from : TOP OF CASING ELEVATION

ELAPSED TIME (sec)	WATER LEVEL (ft)	WATER ELEV. (ft AMSL)	DRAWDOWN (ft)
5	9.25	649.26	0.05
30	9.23	649.28	0.03
60	9.22	649.29	0.02
90	9.22	649.29	0.02
120	9.22	649.29	0.02
180	9.21	649.30	0.01

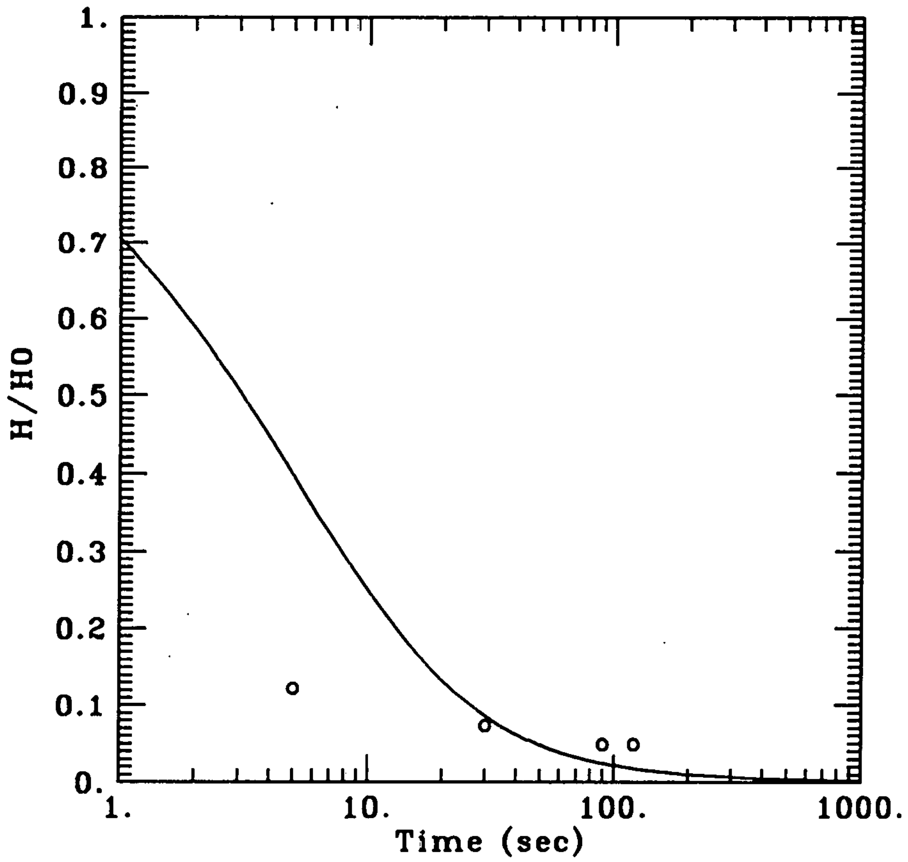
Conestoga Rovers & Associates

Client: **Leica Inc.**

Project No.: **3967**

Location: **Cheektowaga, New York**

RISING HEAD TEST @ MW-15A (2)



DATA SET:
mw15a_2.dat
09/13/94

AQUIFER TYPE:
Confined
SOLUTION METHOD:
Cooper et al.
TEST DATE:
03/23/94
TEST WELL:
MW-15A
OBS. WELL:
MW-15A

ESTIMATED PARAMETERS:
T = 0.003769 ft^2/sec
S = 0.1

TEST DATA:
H0 = 0.41 ft
rc = 0.167 ft
rw = 0.167 ft

Client : Leica Inc.
Site Location : Cheektowaga, New York
Project No : 3967
Test Type : RISING HEAD TEST
Observation Well : MW-15A
Start Date/Time : 03/23/94 | 00:00:00
Reference Description : Top of Casing Elevation
Reference Elevation : 658.51 ft AMSL

Static Water Level : 9.21 ft

Water level measured from : TOP OF CASING ELEVATION

ELAPSED TIME (sec)	WATER LEVEL (ft)	WATER ELEV. (ft AMSL)	DRAWDOWN (ft)
5	9.20	649.31	-0.01
30	9.20	649.31	-0.01
60	9.20	649.31	-0.01

Client : Leica Inc.
Site Location : Cheektowaga, New York
Project No : 3967
Test Type : RISING HEAD TEST
Observation Well : MW-15A
Start Date/Time : 03/23/94 | 00:00:00
Reference Description : Top of Casing Elevation
Reference Elevation : 658.51 ft AMSL

Static Water Level : 9.20 ft

Water level measured from : TOP OF CASING ELEVATION

ELAPSED TIME (sec)	WATER LEVEL (ft)	WATER ELEV. (ft AMSL)	DRAWDOWN (ft)
5	9.25	649.26	0.05
30	9.21	649.30	0.01
60	9.20	649.31	0.00

Client : Leica Inc.
Site Location : Cheektowaga, New York
Project No : 3967
Test Type : RISING HEAD TEST
Observation Well : MW-17A
Start Date/Time : 03/23/94 | 00:00:00
Reference Description : Top of Casing Elevation
Reference Elevation : 659.18 ft AMSL

Static Water Level : 6.46 ft

Water level measured from : TOP OF CASING ELEVATION

ELAPSED TIME (sec)	WATER LEVEL (ft)	WATER ELEV. (ft AMSL)	DRAWDOWN (ft)
5	7.04	652.14	0.58
30	6.47	652.71	0.01
60	6.46	652.72	0.00

Client : Leica Inc.
Site Location : Cheektowaga, New York
Project No : 3967
Test Type : RISING HEAD TEST
Observation Well : MW-17A
Start Date/Time : 03/23/94 | 00:00:00
Reference Description : Top of Casing Elevation
Reference Elevation : 659.18 ft AMSL

Static Water Level : 6.46 ft

Water level measured from : TOP OF CASING ELEVATION

ELAPSED TIME (sec)	WATER LEVEL (ft)	WATER ELEV. (ft AMSL)	DRAWDOWN (ft)
5	7.01	652.17	0.55
30	6.49	652.69	0.03
60	6.46	652.72	0.00

E

APPENDIX E

GEOTECHNICAL TESTING REPORTS

GEOTECHNICAL TESTING REPORT
LEICA, INC.
CHEEKTOWAGA, NEW YORK

FOR:
CONESTOGA-ROVERS & ASSOCIATES
NIAGARA FALLS, NEW YORK

JOB NO. G047.010
APRIL, 1994

Huntingdon
Consulting Engineers Environmental Scientists

Empire Soils Investigations, Inc.
Corporate Offices
140 Telegraph Road
Box 297
Middleport, New York 14105
(716)735-3502
Fax: (716)735-9027

May 5, 1994

Mr. Kevin P. Lynch, PE
Conestoga-Rovers & Associates
7703 Niagara Falls Blvd.
Niagara Falls, NY 14304

SUBJECT: GEOTECHNICAL TESTING
LEICA, INC., CHEEKTOWAGA, NEW YORK
CRA PROJECT NO. 3967

Dear Mr. Lynch:

Transmitted herewith are the results of geotechnical laboratory testing performed on eight (8) jar samples from the subject project, which were delivered to our laboratory in Middleport, New York, on April 11, 1994.

The samples were identified and catalogued as follows:

LAB NO.	BORING NO.	SAMPLE DEPTH(FT)
1967.001	MW-1A	5.0 - 7.0
1967.002	MW-1A	13.0 - 13.6
1967.003	MW-1A	9.0 - 11.0
1967.004	MW-17A	9.0 - 13.0
1967.005	MW-21	3.0 - 6.0
1967.006	MW-21	10.0 - 12.0
1967.007	MW-22	2.0 - 4.0
1967.008	MW-22	7.0 - 9.0

As requested on Chain-of-Custody Record No. NF-0159, we have performed Grain Size Distribution Analysis (ASTM D422) to define the diameter of grains for which 10 percent of the particles were smaller, D_{10}.

Some of the samples were too fine grained to define D_{10} within the limitations of our computer generated report format. With your consent we terminated the hydrometer analysis after 1800 minutes of sedimentation and calculated the following particle diameters and percent finer at the final reading:

LAB NO.	DIAMETER(mm)	PERCENT FINER
1967.001	0.0009	38.5
1967.003	0.0011	11.0
1967.005	0.0010	29.6
1967.006	0.0011	12.0
1967.007	0.0011	24.3

The individual Grain Size Distribution Test Reports are attached.

Should you have any questions or in case we may be of further service, do not hesitate to contact the undersigned at 716-735-3400.

Respectfully submitted,

EMPIRE SOILS INVESTIGATIONS, INC.

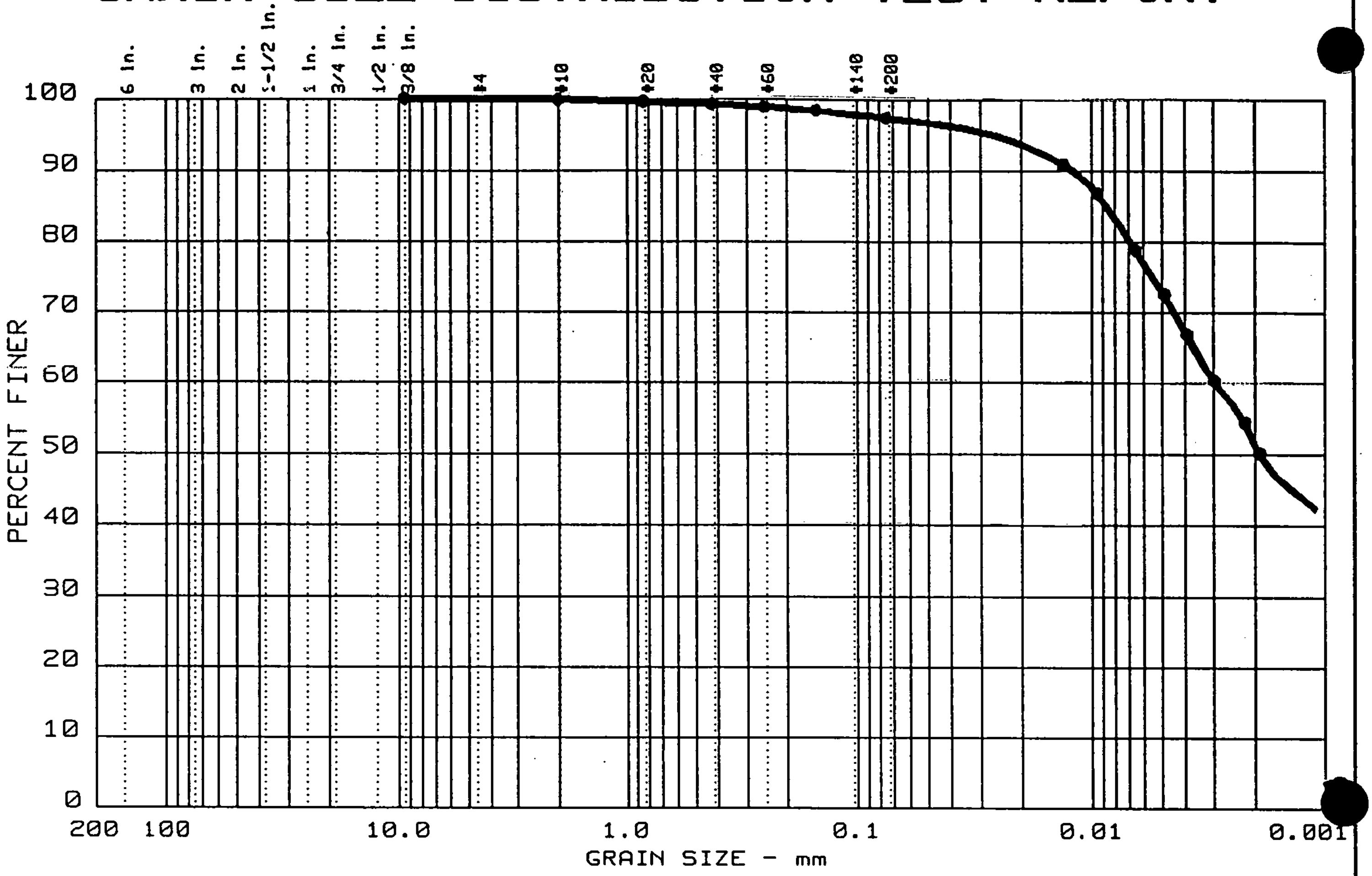
Jorgen F. Christiansen

Jorgen F. Christiansen, PE
Director, of Geotechnical Testing

JFC/tas

Attachments

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
●	5	0.0	0.0	2.6	24.4	73.0

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●					0.00					

MATERIAL DESCRIPTION	USCS	AASHTO
● BROWN CLAY, Some Silt, trace sand		

Project No.: G047.010
Project: LEICA INC.
● Location: MW -1A / 5.0'- 7.0'

Date: APRIL 19, 1994

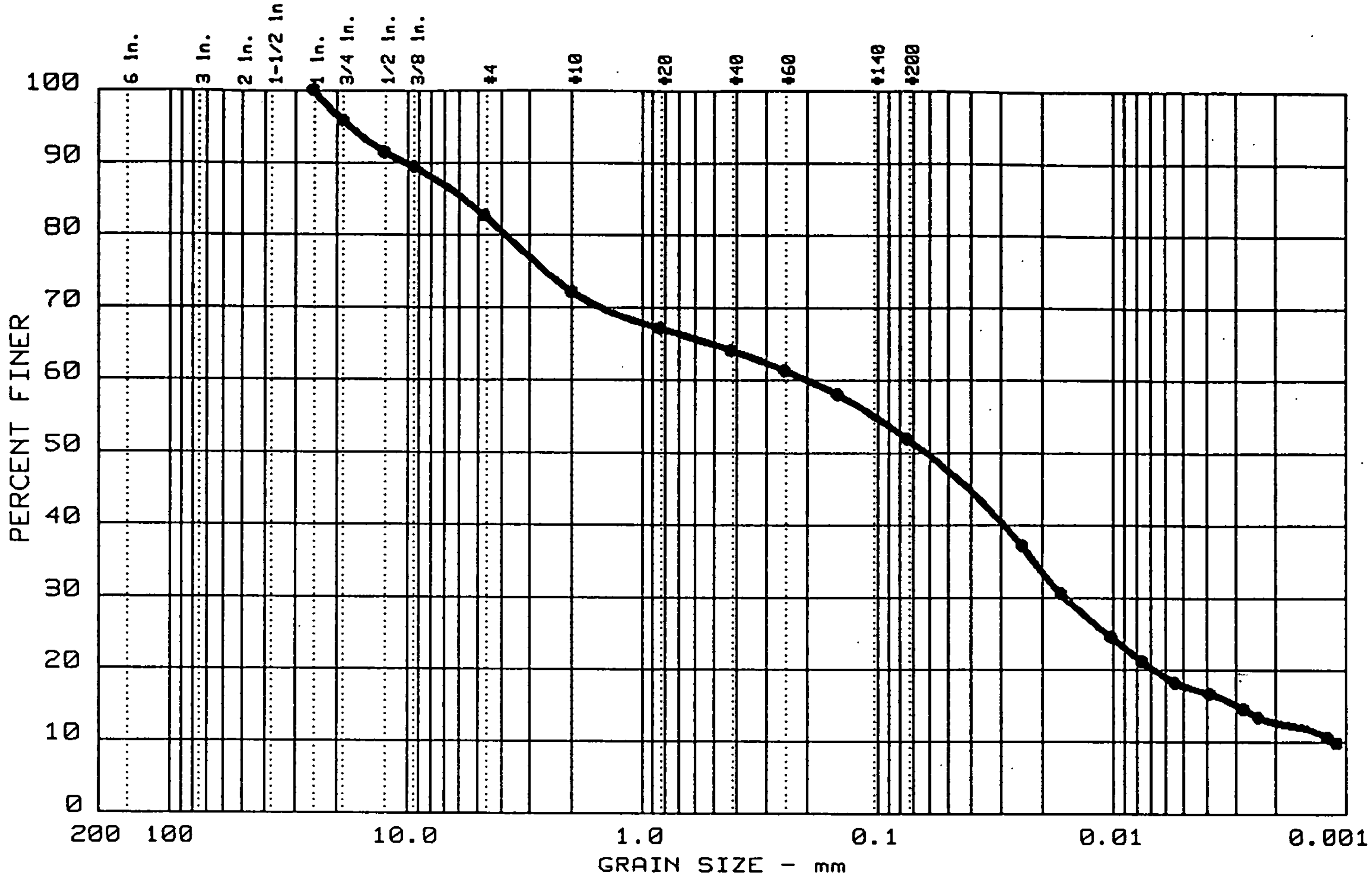
Remarks:
CLIENT: CONESTOGA ROVERS
& ASSOCIATES

LAB NO. 1967.001

GRAIN SIZE DISTRIBUTION TEST REPORT
HUNTINGDON ENGINEERING & ENVIRONMENTAL

Figure No. 1

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
●	6	0.0	17.4	30.7	34.2	17.7

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●			5.82	0.20	0.06	0.016	0.0029	0.0011	1.17	177.8

MATERIAL DESCRIPTION	USCS	AASHTO
● BROWN SILT, Some Sand, Little Clay & Gravel		

Project No.: G047.010
Project: LEICA INC.
● Location: MW -1A / 13.0'- 13.6'

Date: APRIL 19, 1994

GRAIN SIZE DISTRIBUTION TEST REPORT

HUNTINGDON ENGINEERING & ENVIRONMENTAL

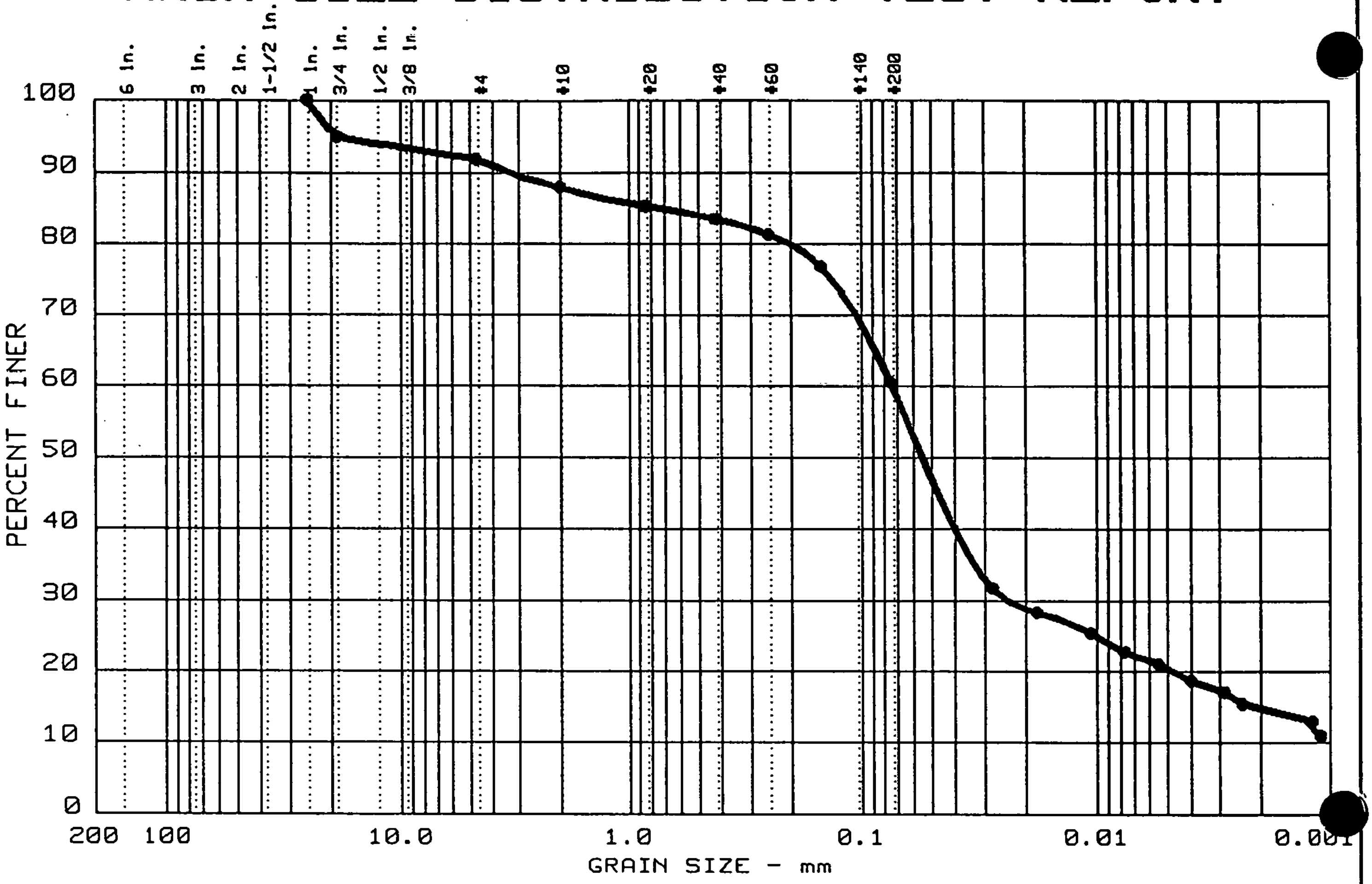
Remarks:

CLIENT: CONESTOGA ROVERS
& ASSOCIATES

LAB NO. 1967.002

Figure No. 1

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
●	7	0.0	8.1	31.4	40.2	20.3

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●			0.75		0.05	0.024	0.0021			

MATERIAL DESCRIPTION	USCS	AASHTO
● BROWN SILT, Some Sand & Clay, trace gravel		

Project No.: G047.010
Project: LEICA INC.
● Location: MW -1A / 9.0'- 11.0'

Date: APRIL 19, 1994

GRAIN SIZE DISTRIBUTION TEST REPORT

HUNTINGDON ENGINEERING & ENVIRONMENTAL

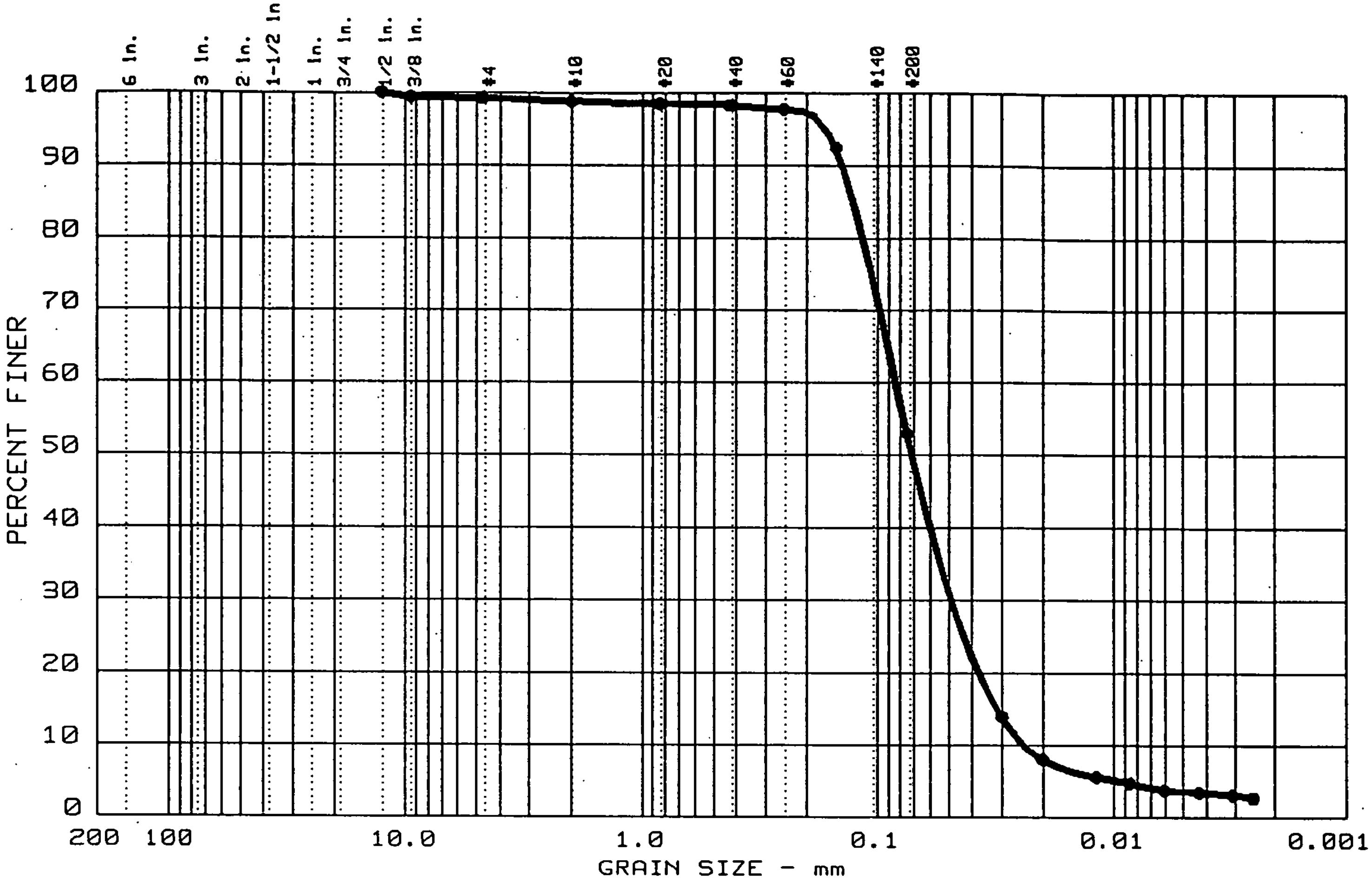
Remarks:

CLIENT: CONESTOGA ROVERS
& ASSOCIATES

LAB NO. 1967.003

Figure No. 1

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
●	8	0.0	0.8	46.3	49.3	3.6

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●			0.13	0.08	0.07	0.049	0.0314	0.0241	1.17	3.5

MATERIAL DESCRIPTION	USCS	AASHTO
● BROWN SILT AND SAND, trace clay & gravel		

Project No.: G047.010
Project: LEICA INC.
● Location: MW -17A / 9.0'- 13.0'

Date: APRIL 19, 1994

Remarks:

CLIENT: CONESTOGA ROVERS
& ASSOCIATES

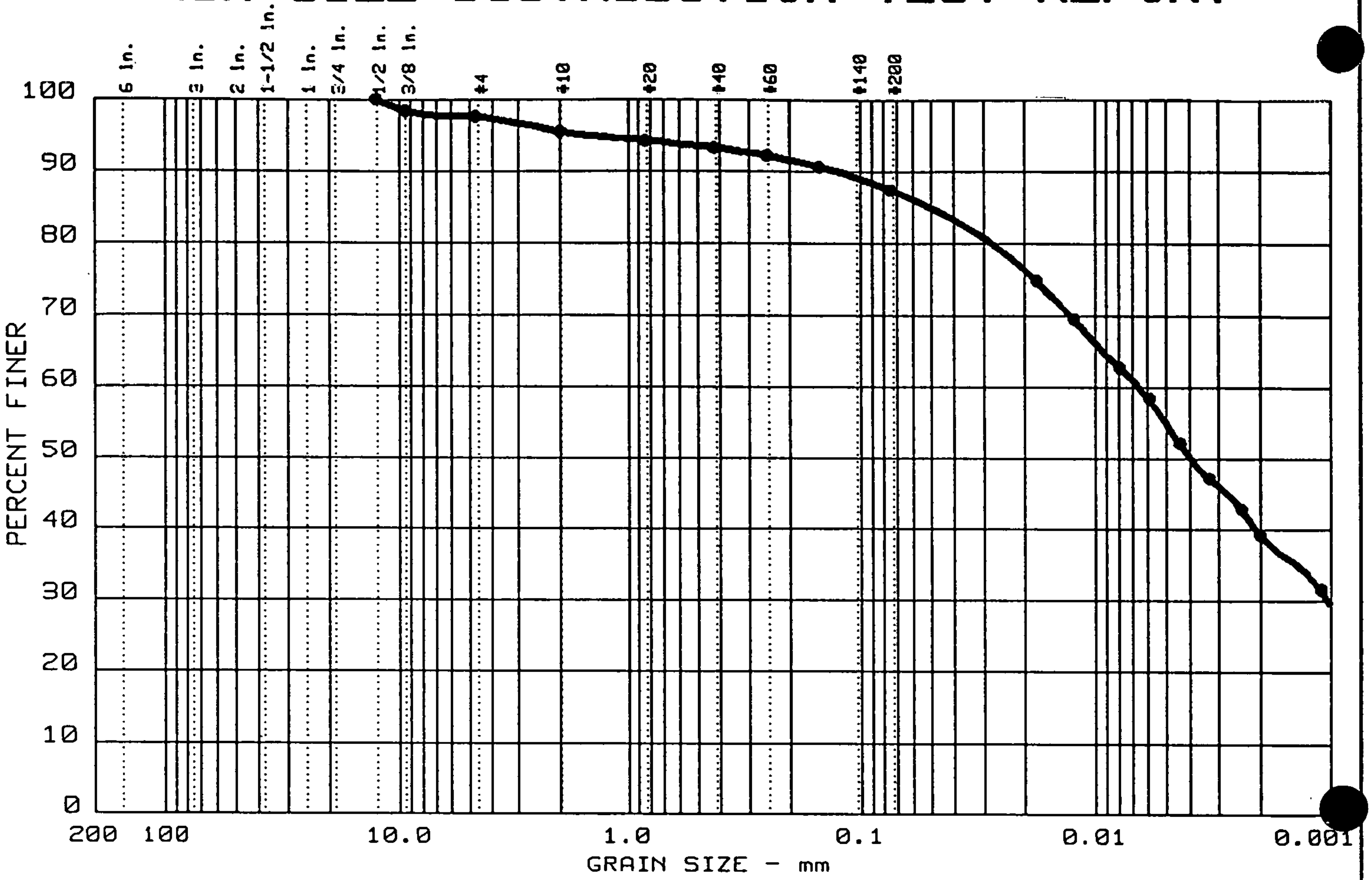
LAB NO. 1967.004

GRAIN SIZE DISTRIBUTION TEST REPORT

HUNTINGDON ENGINEERING & ENVIRONMENTAL

Figure No. 1

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
●	9	0.0	2.4	10.2	32.4	55.0

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●					0.00	0.001				

MATERIAL DESCRIPTION	USCS	AASHTO
● BROWN CLAY, Some Silt, Little Sand, trace grvl		

Project No.: G047.010
Project: LEICA INC.
● Location: MW -21 / 3.0'- 6.0'

Date: APRIL 19, 1994

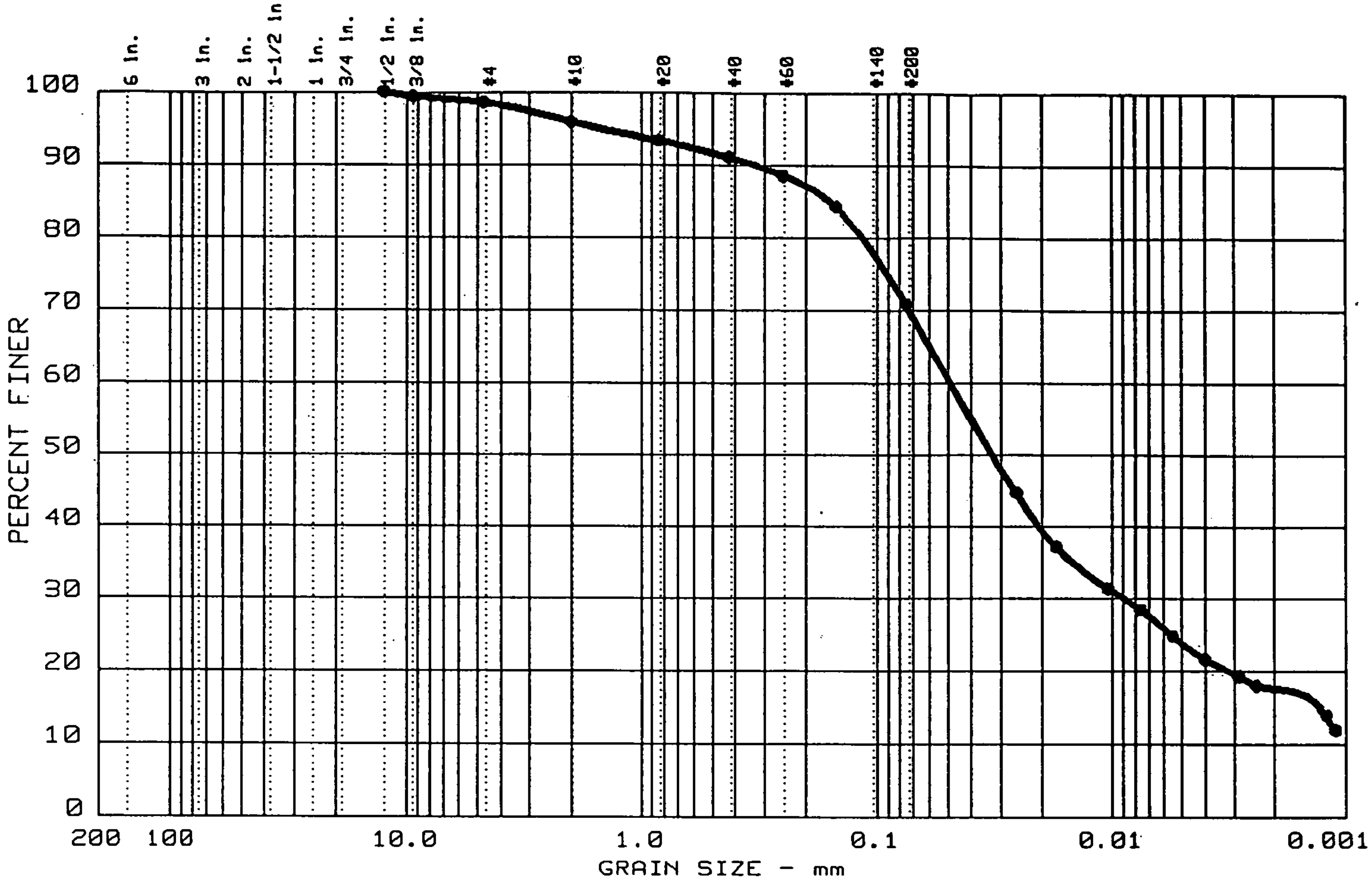
GRAIN SIZE DISTRIBUTION TEST REPORT
HUNTINGDON ENGINEERING & ENVIRONMENTAL

Remarks:
CLIENT: CONESTOGA ROVERS
& ASSOCIATES

LAB NO. 1967.005

Figure No. 1

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
●	10	0.0	1.4	27.9	46.9	23.8

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●			0.16		0.03	0.009	0.0013			

MATERIAL DESCRIPTION	USCS	AASHTO
● BROWN SILT, Some Sand & Clay, trace gravel		

Project No.: G047.010
Project: LEICA INC.
● Location: MW -21 / 10.0'- 12.0'

Date: APRIL 19, 1994

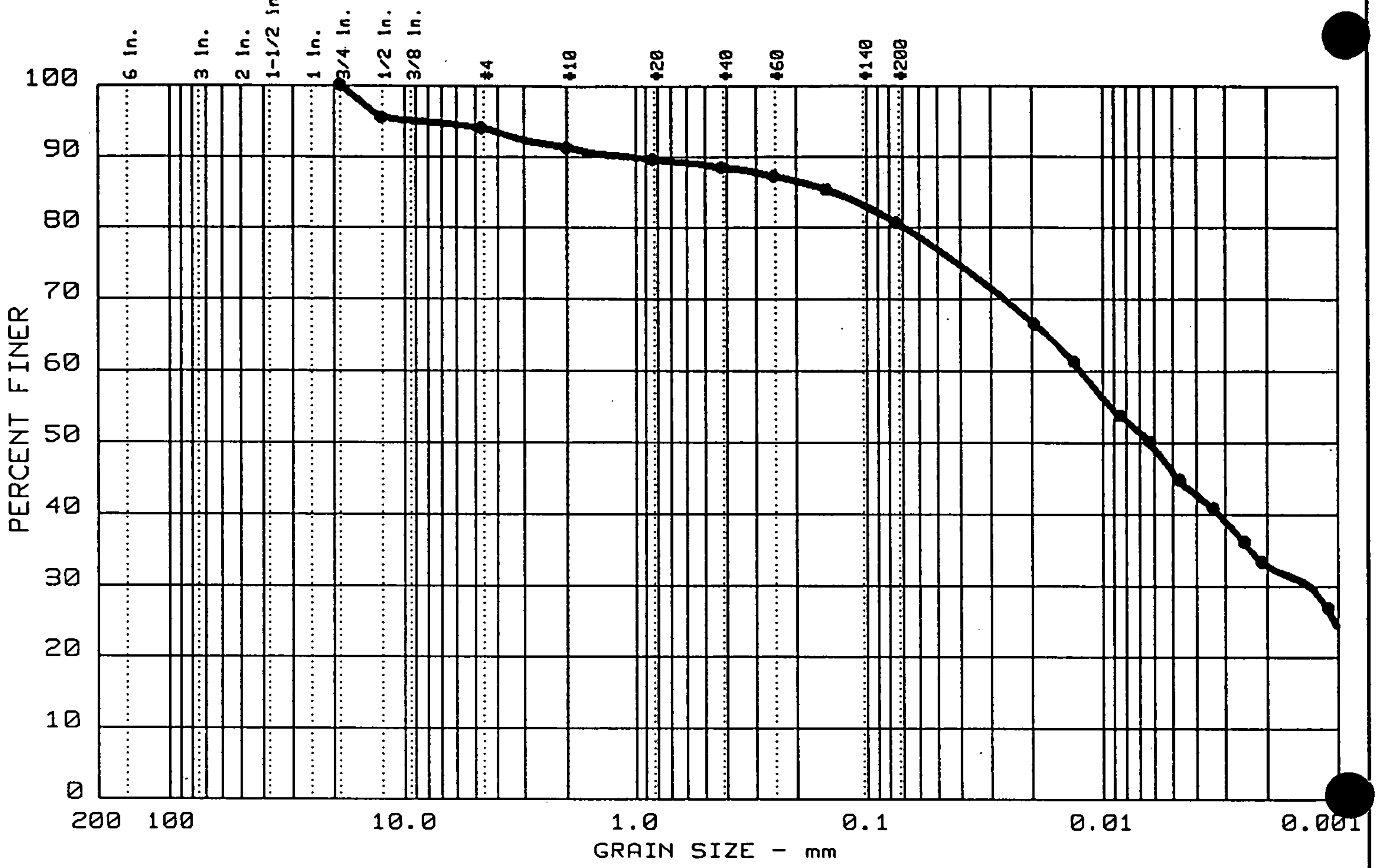
Remarks:
CLIENT: CONESTOGA ROVERS
& ASSOCIATES

LAB NO. 1967.006

GRAIN SIZE DISTRIBUTION TEST REPORT
HUNTINGDON ENGINEERING & ENVIRONMENTAL

Figure No. 1

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
●	11	0.0	5.9	13.5	34.7	45.9

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●			0.14		0.01	0.001				

MATERIAL DESCRIPTION	USCS	AASHTO
● BROWN CLAY, Some Silt, Little Sand, trace grvl		

Project No.: G047.010
Project: LEICA INC.
● Location: MW -22 / 2.0'- 4.0'

Date: APRIL 19, 1994

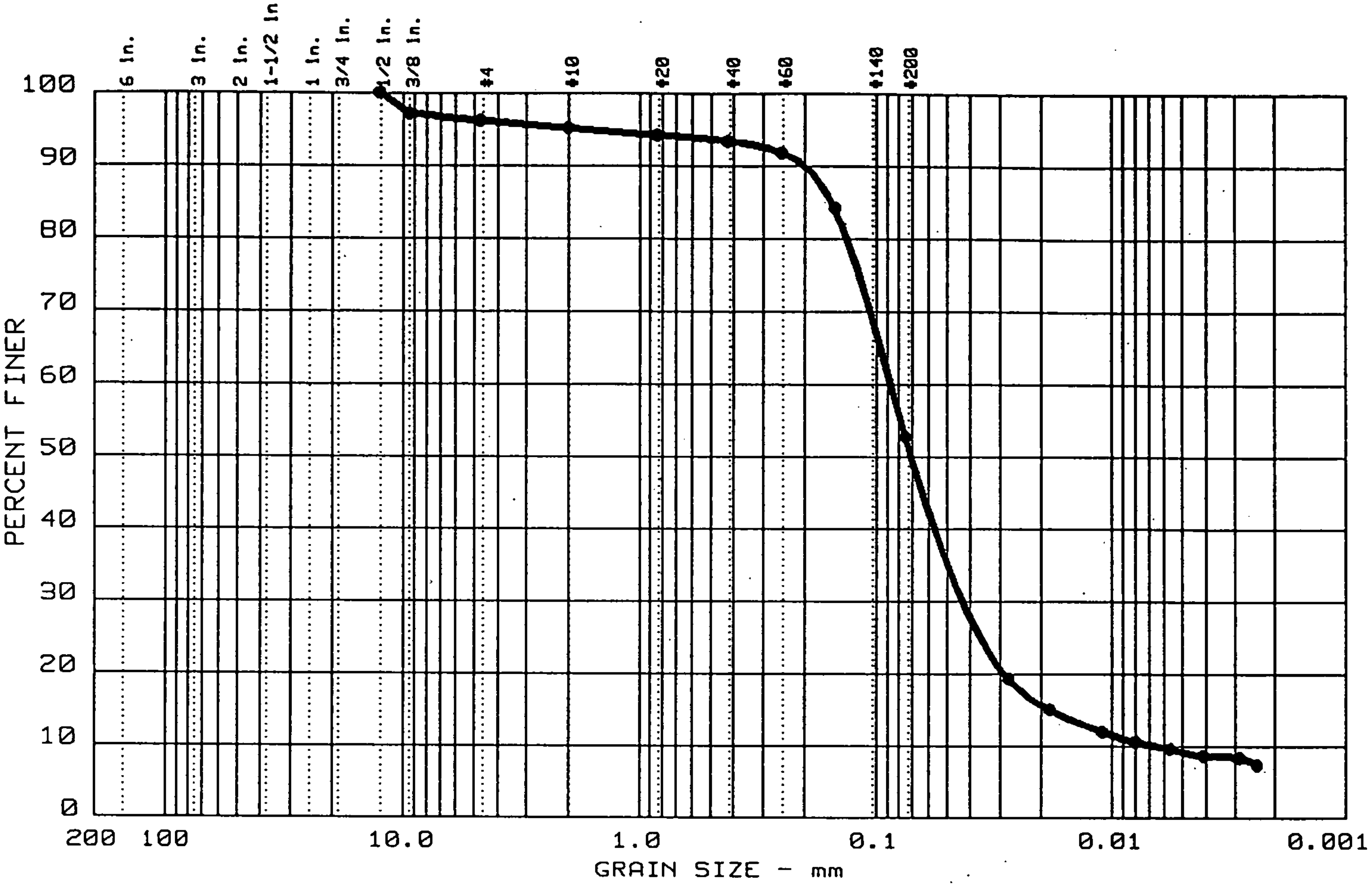
GRAIN SIZE DISTRIBUTION TEST REPORT
HUNTINGDON ENGINEERING & ENVIRONMENTAL

Remarks:
CLIENT: CONESTOGA ROVERS
& ASSOCIATES

LAB NO. 1967.007

Figure No. 1

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
●	12	0.0	3.9	43.4	43.6	9.1

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●			0.15	0.09	0.07	0.043	0.0184	0.0063	3.33	13.7

MATERIAL DESCRIPTION	USCS	AASHTO
● BROWN SILT AND SAND, trace clay & gravel		

Project No.: G047.010
Project: LEICA INC.
● Location: MW -22 / 7.0'- 9.0'

Date: APRIL 19, 1994

GRAIN SIZE DISTRIBUTION TEST REPORT
HUNTINGDON ENGINEERING & ENVIRONMENTAL

Remarks:
CLIENT: CONESTOGA ROVERS
& ASSOCIATES

LAB NO. 1967.008

Figure No. 1

GEOTECHNICAL TESTING REPORT
LEICA, INC.
CHEEKTOWAGA, NEW YORK

FOR:
CONESTOGA-ROVERS & ASSOCIATES
NIAGARA FALLS, NEW YORK

JOB NO. G047.010
FEBRUARY, 1994

Huntingdon
Consulting Engineers Environmental Scientists

Empire Soils Investigations, Inc.
Corporate Offices
140 Telegraph Road
Box 297
Middleport, New York 14105
(716)735-3502
Fax: (716)735-9027

February 28, 1994

Mr. Kevin P. Lynch, PE
Conestoga-Rovers & Associates
7703 Niagara Falls Boulevard
Niagara Falls, NY 14304

SUBJECT: GEOTECHNICAL TESTING
LEICA, INC., CHEEKTOWAGA, NEW YORK
CRA PROJECT NO. 3967

Dear Mr. Lynch:

Transmitted herewith are the results of geotechnical laboratory testing performed on one (1) thin wall tube sample from the subject project, which was delivered to our laboratory in Middleport, New York, on February 9, 1994.

The sample was identified and catalogued as follows:

LAB NO.	BORING NO.	SAMPLE DEPTH (FT)
1945.001	MW-13	3.0 - 5.0

As requested on Chain-of-Custody Record NO. NF-0536, we have performed Grain Size Distribution Analysis (ASTM D422), Atterberg Limits (ASTM D4318), Permeability (ASTM D5084), and Specific Gravity (ASTM D854) as part of the determination of the porosity of the permeability specimen.

Individual test reports for Grain Size Distribution test, Atterberg Limits test, and Permeability test are attached.

The result of the Specific Gravity test was G=2.82. This value applied to the dry mass and measured dimensions of the permeability specimen resulted in a calculated porosity n=0.373.

RECEIVED
MAR 1994
CRA N.F. OFC

Should you have any questions or in case we may be of further service, do not hesitate to contact the undersigned at 716-735-3400.

Respectfully submitted,

EMPIRE SOILS INVESTIGATIONS, INC.

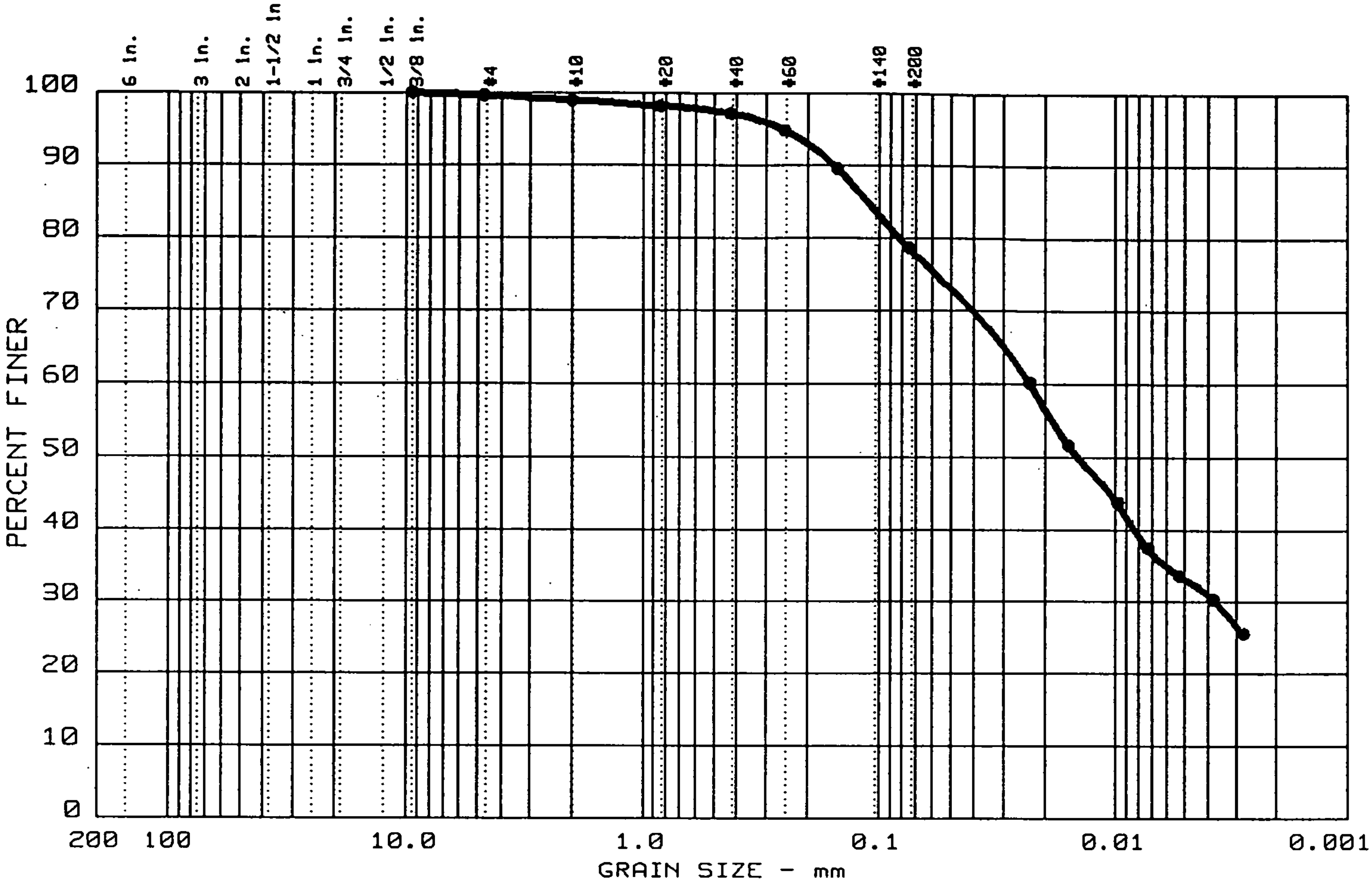
Jorgen F. Christiansen

Jorgen F. Christiansen, PE
Director, Geotechnical Laboratory

JFC/tas

Attachments

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
●	1	0.0	0.4	21.0	45.5	33.1

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●	37	22	0.11		0.01	0.004				

MATERIAL DESCRIPTION	USCS	AASHTO
● BROWN SILT, Some Clay & Sand, trace gravel	CL	

Project No.: G047.010
Project: LEICA INC.
● Location: MW-13 / 3.0'- 5.0'

Date: FEBRUARY 16, 1994

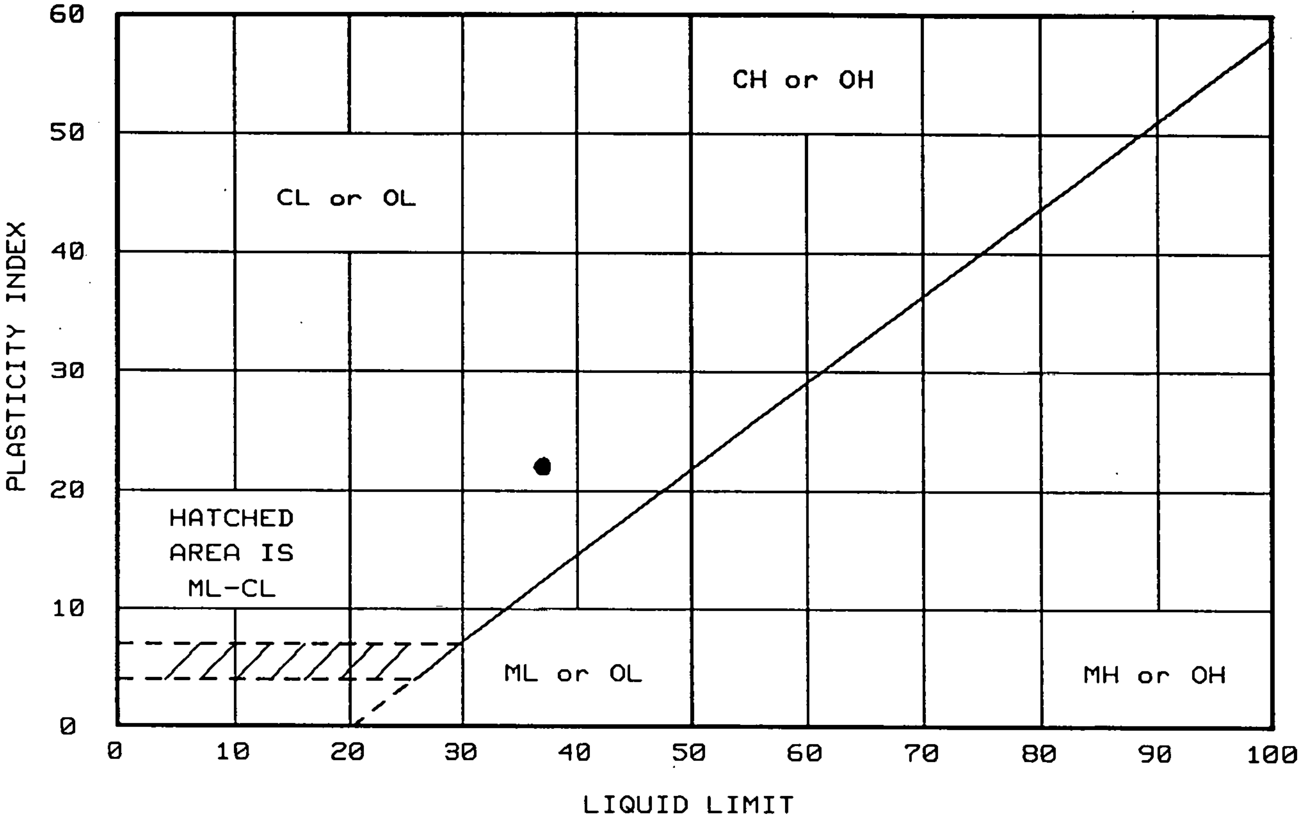
GRAIN SIZE DISTRIBUTION TEST REPORT

HUNTINGDON ENGINEERING & ENVIRONMENTAL

Remarks:
CLIENT: CONESTOGA-ROVERS
& ASSOCIATES
SPECIFIC GRAVITY: 2.82
LAB NO. 1945.001

Figure No. 1

LIQUID AND PLASTIC LIMITS TEST REPORT



	Location + Description	LL	PL	PI	-200	ASTM D 2487-90
●	MW-13 3.0'- 5.0'	37	15	22	78.6	CL, Lean clay with sand

Project No.: G047.010
Project: LEICA INC.

Client: CONESTOGA - ROVERS & ASSOC.
Location:

Date: FEB. 16, 1994

LIQUID AND PLASTIC LIMITS TEST REPORT

HUNTINGTON ENGINEERING & ENVIRONMENTAL, INC.

Remarks:

MATERIAL SIEVED THRU #40

LAB NO. 1945.001

Fig. No. 1

PERMEABILITY TEST REPORT

TEST DATA:

Specimen Height (cm): 6.97
Specimen Diameter (cm): 7.22
Dry Unit Weight (pcf): 110.4
Moisture Before Test (%): 19.5
Moisture After Test (%): 19.1

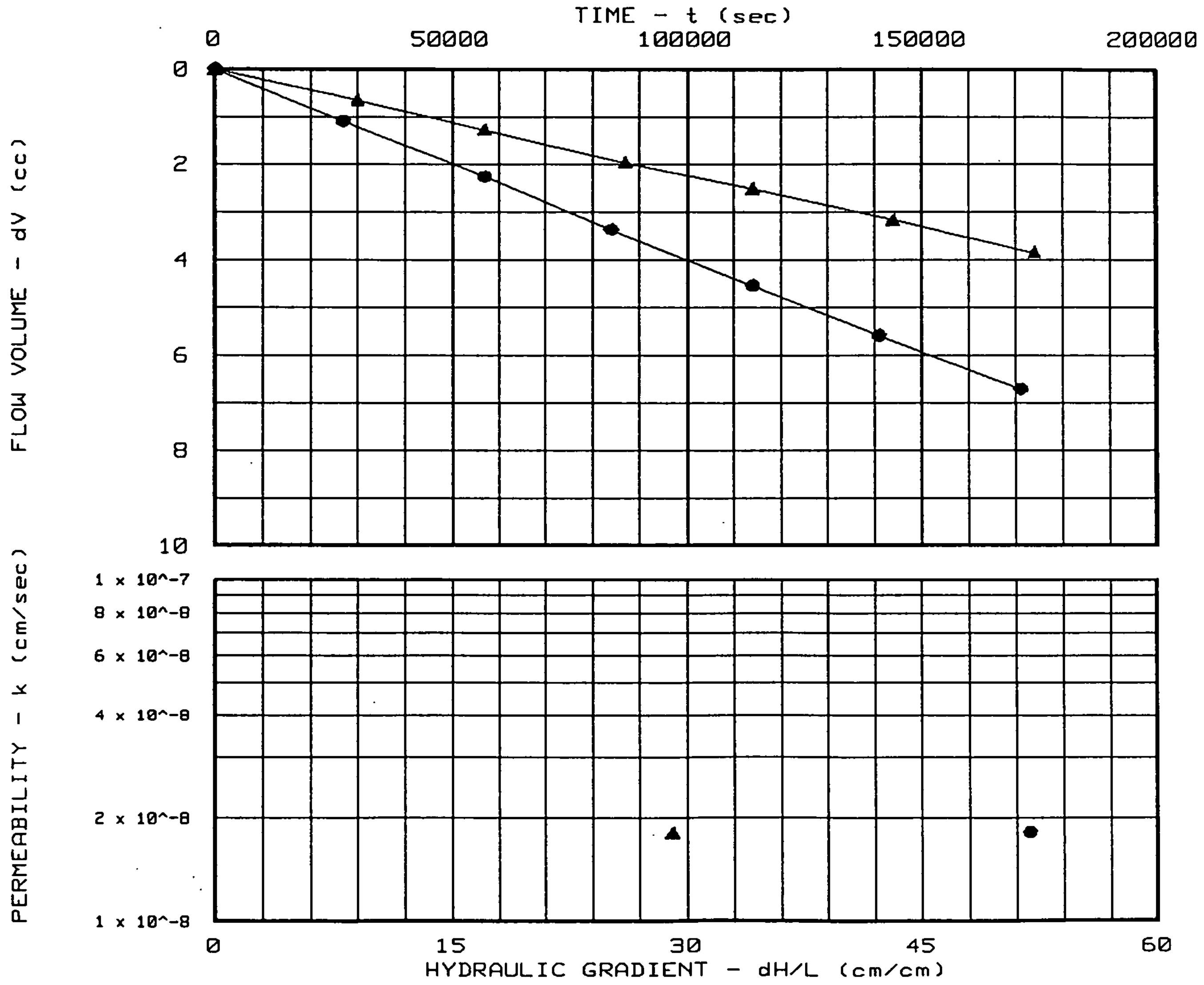
Run Number:	1 ●	2 ▲
Cell Pressure (psi):	95.0	95.0
Test Pressure (psi):	85.0	82.5
Back Pressure (psi):	79.9	79.6
Diff. Head (psi):	5.1	2.9
Flow Rate (cc/sec):	3.85 x 10^-5	2.16 x 10^-5
Perm. (cm/sec):	1.81 x 10^-8	1.81 x 10^-8

SAMPLE DATA:

Sample Identification: MW - 13
DEPTH: 3.0'- 5.0'
Visual Description: MOTTLED OLIVE/BROWN CLAY & SILT, Little Sand, trace gravel
Remarks:

Maximum Dry Density (pcf):
Optimum Moisture Content (%):

Percent Compaction:
Permeameter type: FLEXIBLE WALL
Sample type: UNDISTURBED



Project: LEICA INC.
Location:
Date: FEB. 1994

PERMEABILITY TEST REPORT

EMPIRE SOILS INVESTIGATIONS, INC.

Project No.:
File No.: G047.010
Lab No.: 1945.001
Tested by: KJC
Checked by: JFC ✓

PERMEABILITY TEST DATA

PROJECT DATA

Project Name: LEICA INC.
File No.: G047.010
Project Location:
Project No.:
Sample Identification: MW - 13
DEPTH: 3.0'- 5.0'
Lab No.: 1945.001
Description: MOTTLED OLIVE/BROWN
CLAY & SILT, Little Sand, trace gravel
Sample Type: UNDISTURBED
Max. Dry Dens.:
Method (D1557/D698):
Opt. Water Content:
Date: FEB. 1994
Remarks:

Permeameter Type: FLEXIBLE WALL
Tested by: KJC

PERMEABILITY TEST SPECIMEN DATA

	Before test:			After test:		
Diameter:	1	2		1	2	
Top:	2.839 in	2.853 in		2.839 in	2.821 in	
Middle:	2.838 in	2.847 in		2.827 in	2.854 in	
Bottom:	2.851 in	2.841 in		2.859 in	2.850 in	
Average:	2.84 in	7.22 cm		2.84 in	7.22 cm	
Length:	1	2	3	1	2	3
	2.741 in	2.755 in	2.731 in	2.711 in	2.699 in	2.718 in
Average:	2.74 in	6.97 cm		2.71 in	6.88 cm	

Moisture, Density and Sample Parameters:

	Before test:	After test:
Specific Gravity:	2.82	
Wet Wt. & Tare:	832.79	830.61
Dry Wt. & Tare:	734.40	734.40
Tare Wt.:	229.59	229.59
Moisture Content:	19.5 %	19.1 %
Dry Unit Weight:	110.4 pcf	111.9 pcf
Porosity:	0.3731	0.3641
Saturation:	92.4 %	93.9 %

PERMEABILITY TEST CONDITIONS DATA

Cell No.: FP-10 Panel No.: 5 Positions: 4 & 3

Run Number:	1	2
Cell Pressure:	95.0 psi	95.0 psi
Saturation Pressure:	80.0 psi	80.0 psi
Inflow Buret Factor:	1.00	1.00
Outflow Buret Factor:	1.00	1.00
Test Temperature:	20.0 °C	20.0 °C

PERMEABILITY TEST READINGS DATA

CASE X or R	DATE	TIME (24 hr)	ELAPSED TIME (sec)	GAUGE PRESSURE (psi) IN	GAUGE PRESSURE (psi) OUT	BURET READING (cc) IN	BURET READING (cc) OUT	FLOW VOLUME (cc) AVERAGE
X	2/14/94	8: 2	0	85.0	80.3	0.00	24.60	0.00
X	2/14/94	15:32	27,000	85.0	80.1	1.10	23.50	1.10
X	2/14/94	23:52	57,000	85.0	80.0	2.25	22.30	2.28
	2/15/94	7:22	84,000	84.9	80.0	3.35	21.20	3.38
	2/15/94	15:42	114,000	84.9	80.1	4.55	20.05	4.55
	2/15/94	23:12	141,000	85.1	80.1	5.60	19.00	5.60
	2/16/94	7:32	171,000	85.0	80.1	6.75	17.90	6.73

Test Pressure = 85.0 psi Differential Head = 5.1 psi, 361.0 cm H2O
Gradient = 5.182E 01 Flow rate = 3.854E-05 cc/sec R squared = 0.99989
Permeability, K20.0° = 1.814E-08 cm/sec^2, K20° = 1.814E-08 cm/sec^2

SECOND RUN PERMEABILITY TEST READINGS DATA

CASE X or R	DATE	TIME (24 hr)	ELAPSED TIME (sec)	GAUGE PRESSURE (psi) IN	GAUGE PRESSURE (psi) OUT	BURET READING (cc) IN	BURET READING (cc) OUT	FLOW VOLUME (cc) AVERAGE
X	2/17/94	7:42	0	82.6	80.0	0.05	24.70	0.00
X	2/17/94	16: 2	30,000	82.5	79.9	0.70	24.05	0.65
X	2/17/94	23:32	57,000	82.6	79.9	1.30	23.40	1.28
	2/18/94	7:52	87,000	82.5	79.9	2.00	22.70	1.98
	2/18/94	15:22	114,000	82.4	79.8	2.55	22.15	2.53
	2/18/94	23:42	144,000	82.5	79.9	3.20	21.50	3.18
	2/19/94	8: 2	174,000	82.4	79.9	3.85	20.80	3.85

Test Pressure = 82.5 psi Differential Head = 2.9 psi, 202.5 cm H2O
Gradient = 2.907E 01 Flow rate = 2.157E-05 cc/sec R squared = 0.99954
Permeability, K20.0° = 1.810E-08 cm/sec^2, K20° = 1.810E-08 cm/sec^2

F

APPENDIX F

WELL PURGING RECORDS

WELL PURGING AND SAMPLE COLLECTION SUMMARY LOG
GROUNDWATER ROUND I
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
LEICA INC.
CHEEKTOWAGA, NEW YORK
JANUARY 1994

Monitoring Well Number:	*MW-1*	*MW-2*	*MW-3*
Well Measurements			
Well Depth (Sounded) (below top of casing)	12.27 Ft.	8.10 Ft.	10.8 Ft.
Depth to Water Table (below top of casing)	7.05 Ft.	7.26 Ft.	6.8 Ft.
Height of Water Column	5.22 Ft.	0.84 Ft.	4.0 Ft.
Volume of Water in Well	0.84 Gallons	0.13 Gallons	0.67 Gallons
Water Removed per Volume	0.9 Gallons	0.15 Gallons	0.7 Gallons

Purge/Sample Record

Purge Volume Number:	1	2	3	4	5	1	2	3	1	2	3	4	5
Volume Purged (Gal.):	0.9	0.9	0.9	0.9	0.9	0.15	0.15	0.15	0.75	0.75	0.75	0.75	0.75
pH (standard units):	7.10	7.16	7.11	7.03	7.14	7.31	7.4	7.39	7.77	7.62	7.52	7.56	7.53
Conductivity (mmho/cm):	1640	1590	1600	1560	1560	600	560	560	1040	1080	1100	1100	1080
Temperature (°F):	45.2	49.3	49.5	48.9	49.1	NM	NM	NM	NM	46.4	45.8	45.6	46.0

Total Purge Volume:	4.5 Gallons	0.45 Gallons	3.75 Gallons
Sample Number:	MW-1-194-I	MW-2-194-I	MW-3-194-I
Sample Description:			
pH	7.24	7.38	7.55
Conductivity	1610	550	1090
Temperature (°F)	NM	NM	NM
	Clear, colorless, no sheen, no odor	Light brown, little fine sediment,	Clear to slightly cloudy, colorless,
Parameters:	TCL VOCs, TPH	TCL VOCs, TPH	TCL VOCs, TPH

WELL PURGING AND SAMPLE COLLECTION SUMMARY LOG
GROUNDWATER ROUND I
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
LEICA INC.
CHEEKTOWAGA, NEW YORK
JANUARY 1994

Monitoring Well Number:	MW-4			MW-5					MW-6				
Well Measurements													
Well Depth (Sounded) (below top of casing)	12.80 Ft.			11.4 Ft.					15.1 Ft.				
Depth to Water Table (below top of casing)	9.10 Ft.			6.7 Ft.					11.9 Ft.				
Height of Water Column	3.70 Ft.			4.7 Ft.					3.2 Ft.				
Volume of Water in Well	0.60 Gallons			0.75 Gallons					0.51 Gallons				
Water Removed per Volume	0.60 Gallons			0.75 Gallons					0.50 Gallons				
Purge/Sample Record													
Purge Volume Number:	1	2	3	1	2	3	4	5	1	2	3	4	5
Volume Purged (Gal.):	0.6	0.6	0.6	0.75	0.75	0.75	0.75	0.75	0.5	0.5	0.5	0.5	0.5
pH (standard units):	6.52	6.85	6.98	8.05	7.79	7.92	7.94	7.89	7.34	7.47	7.58	7.43	7.40
Conductivity (mmho/cm):	1590	1330	1220	1500	1580	1590	1560	1550	1140	1150	1150	1130	1120
Temperature (°F):	45.8	49.6	49.1	45.6	47.7	47.2	-	48.0	46.6	46.2	45.8	46.8	46.8
Total Purge Volume:	2.0 Gallons			3.75 Gallons									
Sample Number:	MW-4-194-I			MW-5-194-I					MW-6-194-I				
Sample Description:													
pH	6.90			7.91					7.34				
Conductivity	1200			1560					1610				
Temperature (°F)	NM			47.6					NM				
	Clear, slightly dark color, slight sulfide odor, black floating particles			Clear, slight sulfide odor, colorless, no sheen					Clear, slight sulfide odor, no sheen, colorless				
Parameters:	TCL VOCs, TPH			TCL VOCs, TPH					TCL VOCs, TPH				

WELL PURGING AND SAMPLE COLLECTION SUMMARY LOG
GROUNDWATER ROUND I
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
LEICA INC.
CHEEKTOWAGA, NEW YORK
JANUARY 1994

Monitoring Well Number:	MW-7	MW-8	*MW-9*
Well Measurements			
Well Depth (Sounded) (below top of casing)	13.00 Ft.	11.90 Ft.	11.0 Ft.
Depth to Water Table (below top of casing)	8.05 Ft.	7.6 Ft.	6.51 Ft.
Height of Water Column	4.95 Ft.	4.3 Ft.	4.49 Ft.
Volume of Water in Well	0.79 Gallons	0.72 Gallons	0.72 Gallons
Water Removed per Volume	0.8 Gallons	0.75 Gallons	0.75 Gallons

Purge/Sample Record

	MW-7					MW-8		MW-9				
Purge Volume Number:	1	2	3	4	5	1	2	1	2	3	4	5
Volume Purged (Gal.):	0.8	0.8	0.8	0.8	0.8			0.75	0.75	0.75	0.75	0.75
pH (standard units):	7.59	7.22	7.39	7.23	7.31			8.23	7.87	7.60	7.50	7.44
Conductivity (mmho/cm):	2340	2490	2610	2550	2600			1650	1740	1850	1820	1800
Temperature (°F):	47.3	48.1	48.4	48.2	48.0			46.9	45.7	46.0	47.7	47.3

	MW-7	MW-8	MW-9
Total Purge Volume:	4.0 Gallons	1.5 Gallons	3.75 Gallons
Sample Number:	MW-7-194-I	MW-11-194-I plus Whiter APL Sample	MW-9-194-I
Sample Description:			
pH	7.20	6.60	7.54
Conductivity	2610	1770	1880
Temperature (°F)	47.8	NM	47.0
	Clear to slight dark color, sulfide odor, no sheen, trace black floating particles	Some floating LNAPL present, no purge measurements due to LNAPL. Clear, slightly dark color, some odor, distinctly whiter color at bottom of water column. White liquid also sampled.	Clear with slight dark color, sulfide odor, no sheen, trace black floating particles
Parameters:	TCL VOCs, TPH	TCL VOCs, TPH	TCL VOCs, TPH

WELL PURGING AND SAMPLE COLLECTION SUMMARY LOG
GROUNDWATER ROUND I
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
LEICA INC.
CHEEKTOWAGA, NEW YORK
JANUARY 1994

Monitoring Well Number:	*MW-10*	*MW-11*	*MW-12*
Well Measurements			
Well Depth (Sounded) (below top of casing)	10.60 Ft.	12.50 Ft.	13.20 Ft.
Depth to Water Table (below top of casing)	7.75 Ft.	9.60 Ft.	9.38 Ft.
Height of Water Column	2.85 Ft.	2.90 Ft.	3.82 Ft.
Volume of Water in Well	0.48 Gallons	0.40 Gallons	0.63 Gallons
Water Removed per Volume	0.50 Gallons	0.50 Gallons	0.7 Gallons

Purge/Sample Record

MW-10

Purge Volume Number:	1	2	3	4	5
Volume Purged (Gal.):	0.5	0.5	0.5	0.5	0.5
pH (standard units):	6.45	7.00	7.26	7.22	7.18
Conductivity (mmho/cm):	990	920	910	910	950
Temperature (°F):	35.1	44.1	48.0	47.1	47.3

MW-11

Purge Volume Number:	1	2	3	4
Volume Purged (Gal.):				
pH (standard units):				
Conductivity (mmho/cm):				
Temperature (°F):				

MW-12

Purge Volume Number:	1	2	3	4	5
Volume Purged (Gal.):	0.7	0.7	0.7	0.7	0.7
pH (standard units):	6.57	7.13	7.36	7.40	7.42
Conductivity (mmho/cm):	2740	2600	2660	2700	2680
Temperature (°F):	40.7	49.1	48.9	49.0	49.1

	MW-10	MW-11	MW-12
Total Purge Volume:	2.5 Gallons	2.0 Gallons	3.5 Gallons
Sample Number:	MW-10-194-I and Duplicate	MW-11-194-I and NAPL Sample	MW-12-194-I
Sample Description:			
pH	NM	6.60 - APL	6.70
Conductivity	NM	3400 - APL	2620
Temperature (°F)	NM	NM	38.8
	Clear, colorless to slightly dark colored, some black floating particles	Clear, chemical odor, trace oily globules, floating	Clear, colorless, no odor, no sheen
Parameters:	TCL VOCs, TPH, 310.13 (no duplicate)	NAPL - TCL VOCs APL - TCL VOCs, TPH	TCL VOCs, TPH

WELL PURGING AND SAMPLE COLLECTION SUMMARY LOG
GROUNDWATER ROUND I
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
LEICA INC.
CHEEKTOWAGA, NEW YORK
JANUARY 1994

Monitoring Well Number:	*MW-13*	*MW-14*	*MW-15*
Well Measurements			
Well Depth (Sounded) (below top of casing)	10.60 Ft.	10.80 Ft.	11.20 Ft.
Depth to Water Table (below top of casing)	2.9 Ft.	3.46 Ft.	7.53 Ft.
Height of Water Column	7.7 Ft.	7.34 Ft.	3.67 Ft.
Volume of Water in Well	1.23 Gallons	1.17 Gallons	0.58 Gallons
Water Removed per Volume	1.25 Gallons	1.2 Gallons	0.60 Gallons

Purge/Sample Record

MW-13

Purge Volume Number:	1	2	3	4	5
Volume Purged (Gal.):	1.25	1.25	1.25	1.25	1.25
pH (standard units):	7.03	7.14	7.22	7.28	7.36
Conductivity (mmho/cm):	1040	1040	1020	1010	1000
Temperature (°F):	NM	NM	NM	41.2	40.8

MW-14

Purge Volume Number:	1	2	3	4	5
Volume Purged (Gal.):	1.2	1.2	1.2	1.2	1.2
pH (standard units):	6.85	7.10	6.96	7.04	7.11
Conductivity (mmho/cm):	1490	1530	1510	1480	1460
Temperature (°F):	NM	NM	41.1	42.6	41.1

MW-15

Purge Volume Number:	1	2	3	4	5
Volume Purged (Gal.):	0.60	0.60	0.60	0.60	0.60
pH (standard units):	8.63	8.31	8.33	8.28	8.26
Conductivity (mmho/cm):	1850	2020	2000	2000	1980
Temperature (°F):	44.1	43.8	44.0	43.7	42.9

	MW-13	*MW-14*	*MW-15*
Total Purge Volume:	6.25 Gallons	6.0 Gallons	3.0 Gallons
Sample Number:	MW-13-194-I and NYSDEC Split Sample (VOCs Only)	MW-14-194-I and Duplicate and NYSDEC Split Sample (VOCs Only)	MW-15-194-I
Sample Description:			
pH	7.28	7.21	8.21
Conductivity	990	1490	1980
Temperature (°F)	NM	42.1	NM
	Clear to slightly cloudy, colorless, trace sediments, no sheen, no odor, trace black floating particles	Clear to slightly cloudy, colorless, H2S odor, no sheen	Clear, slight brown color, no sheen, no odor
Parameters:	TCL VOCs, TCL BNAs, TAL Metals, TPH	TCL VOCs, TCL BNAs, TAL Metals, TPH	TCL VOCs, TPH

WELL PURGING AND SAMPLE COLLECTION SUMMARY LOG
GROUNDWATER ROUND I
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
LEICA INC.
CHEEKTOWAGA, NEW YORK
JANUARY 1994

Monitoring Well Number:	*MW-16*	*MW-2A*	*MW-5A*
Well Measurements			
Well Depth (Sounded) (below top of casing)	11.80 Ft.	29.9 Ft.	42.0 Ft.
Depth to Water Table (below top of casing)	8.06 Ft.	10.7 Ft.	6.26 Ft.
Height of Water Column		19.2 Ft.	35.74 Ft.
Volume of Water in Well	0.59 Gallons	6.9 Gallons	12.9 Gallons
Water Removed per Volume	0.60 Gallons	7.0 Gallons	13 Gallons

Purge/Sample Record

	MW-16					MW-2A				MW-5A				
Purge Volume Number:	1	2	3	4	5	1	2	3	4	1	2	3	4	5
Volume Purged (Gal.):	0.6	0.6	0.6	0.6	0.6	7.0	7.0	7.0	7.0	13.0	13.0	13.0	13.0	13.0
pH (standard units):	8.04	7.88	7.68	7.84	7.82	8.12	8.22	7.95	7.96	7.09	7.05	7.28	7.60	7.65
Conductivity (mmho/cm):	1660	1660	1700	1780	1750	440	440	450	450	1210	1160	1020	1020	1000
Temperature (°F):	48.5	48.4	48.1	49.0	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM

	MW-16	MW-2A	MW-5A
Total Purge Volume:	3.0 Gallons	28 Gallons	65 Gallons
Sample Number:	MW-16-194-I and MS/MSD	MW-2A-194-I	MW-5A-194-I
Sample Description:			
pH	8.08	7.83	7.60
Conductivity	1760	460	990
Temperature (°F)	48.8	NM	NM
	Clear, colorless, sulfide odor, no sediments	Clear to slightly cloudy, light brown color, no sheen, no odor	Cloudy, light brown color, no sheen, no odor
Parameters:	TCL VOCs, TCL BNAs, TAL Metals, TPH, 310.3	TCL VOCs, TCL BNAs, TAL Metals, TPH	TCL VOCs, TCL BNAs, TAL Metals, TPH

WELL PURGING AND SAMPLE COLLECTION SUMMARY LOG
GROUNDWATER ROUND I
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
LEICA INC.
CHEEKTOWAGA, NEW YORK
JANUARY 1994

Monitoring Well Number:	*MW-6A*	*MW-13A*	*MW-14A*
Well Measurements			
Well Depth (Sounded) (below top of casing)	36.05 Ft.	45.0 Ft.	36.0 Ft.
Depth to Water Table (below top of casing)	13.88 Ft.	8.85 Ft.	9.07 Ft.
Height of Water Column	22.17 Ft.	36.0 Ft.	27.0 Ft.
Volume of Water in Well	8.0 Gallons	13.0 Gallons	10 Gallons
Water Removed per Volume	8.0 Gallons	13.0 Gallons	10 Gallons

Purge/Sample Record

	MW-6A					MW-13A					MW-14A				
Purge Volume Number:	1.	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Volume Purged (Gal.):	8.0	8.0	8.0	8.0	8.0	13.0	13.0	13.0	13.0	13.0	10.0	10.0	10.0	10.0	10.0
pH (standard units):	7.05	7.00	6.80	6.80	6.79	7.02	7.06	6.89	6.89	7.00	6.92	7.10	7.15	6.93	7.00
Conductivity (mmho/cm):	1250	1230	1240	1230	1230	650	660	650	640	660	740	730	730	720	710
Temperature (°F):	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM

	MW-6A	MW-13A	MW-14A
Total Purge Volume:	40 Gallons	70 Gallons	50 Gallons
Sample Number:	MW-6A-194-I	MW-13A-194-I and NYSDEC Split Sample (VOCs only)	MW-14A-194-I and NYSDEC Split Sample (VOCs only)
Sample Description:			
pH	6.78	7.05	7.08
Conductivity	1250	660	720
Temperature (°F)	NM	NM	NM
	Clear, colorless, no sheen, sulfide odor	Clear to slightly cloudy, colorless to white colored, no sheen, no odor	Clear to slightly dark color, sulfide odor, trace black floating particles
Parameters:	TCL VOCs, TCL BNAs, TAL Metals, TPH	TCL VOCs, TCL BNAs, TAL Metals, TPH	TCL VOCs, TCL BNAs, TAL Metals, TPH

WELL PURGING AND SAMPLE COLLECTION SUMMARY LOG
GROUNDWATER ROUND I
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
LEICA INC.
CHEEKTOWAGA, NEW YORK
JANUARY 1994

Monitoring Well Number:	*MW-15A*	*East Well*	*East Well*
Well Measurements			
Well Depth (Sounded) (below top of casing)	36.0 Ft.	178 Ft.	178 Ft.
Depth to Water Table (below top of casing)	13.6 Ft.	21.33 Ft.	21.33 Ft.
Height of Water Column	22.4 Ft.	157 Ft.	157 Ft.
Volume of Water in Well	8 Gallons	408 Gallons	408 Gallons
Water Removed per Volume	8 Gallons	0 Gallons	0 Gallons

Purge/Sample Record

Purge Volume Number:	1	2	3
Volume Purged (Gal.):	8.0	8.0	8.0
pH (standard units):	7.14	7.16	7.20
Conductivity (mmho/cm):	1120	1120	1130
Temperature (°F):	NM	NM	NM

Total Purge Volume:	24 Gallons	0 Gallons	0 Gallons
Sample Number:	MW-15A-194-I	East Well - Top	East Well - Bottom
Sample Description:			
pH	7.16	7.60	7.10
Conductivity	1110	810	1180
Temperature (°F)	NM	NM	NM
	Clear, colorless, no sheen, no odor	Clear, colorless, trace sheen, slight petroleum odor	Clear, colorless, suspended brown solids, petroleum odor, some sheen
Parameters:	TCL VOCs, TCL BNAs, TAL Metals, TPH	TCL VOCs, TAL Metals, TCL BNAs, TPH	TCL VOCs, TCL BNAs, TPH

WELL PURGING AND SAMPLE COLLECTION SUMMARY LOG
GROUNDWATER ROUND I
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
LEICA INC.
CHEEKTOWAGA, NEW YORK
JANUARY 1994

Notes:

APL	Aqueous Phase Liquid.
BNAs	Base/Neutral Acid Extractable.
MS/MSD	Matrix Spike/Matrix Spike Duplicate.
LNAPL	Light Non-Aqueous Phase Liquid.
NM	Not Measured.
NYSDEC	New York State Department of Environmental Conservation.
TAL	Target Analyte List.
TCL	Target Compound List.
TPH	Total Petroleum Hydrocarbon.
VOCs	Volatile Organic Compound.

WELL PURGING AND SAMPLE COLLECTION SUMMARY LOG
GROUNDWATER ROUND II
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
LEICA INC.
CHEEKTOWAGA, NEW YORK
MARCH 1994

Monitoring Well Number:	*MW-1*	*MW-2*	*MW-3*
Well Measurements			
Well Depth (Sounded) (below top of casing)	12.27 Ft.	8.10 Ft.	10.80 Ft.
Depth to Water Table (below top of casing)	5.30 Ft.	7.08 Ft.	5.40 Ft.
Height of Water Column	6.97 Ft.	1.02 Ft.	5.40 Ft.
Volume of Water in Well	1.12 Gallons	0.16 Gallons	0.86 Gallons
Water Removed per Volume	1.1 Gallons	0.2 Gallons	0.9 Gallons

Purge/Sample Record

Purge Volume Number:	1	2	3	4	5	1	2	3	1	2	3	4	5
Volume Purged (Gal.):	1.1	1.1	1.1	1.1	1.1	0.2	0.2	0.2	0.9	1.1	1.0	1.0	1.0
pH (standard units):	pH Meter Failed.					6.14	6.57	6.64	7.18	7.33	NM	7.46	7.38
Conductivity (mmho/cm):						640	630	640	1430	1530	NM	1450	1430
Temperature (°C):						4.2	4.4	4.2	7.1	7.5	NM	7.6	7.5

Total Purge Volume:	6.0 Gallons		5.0 Gallons
Sample Number:	MW-1-394-II	MW-2-394-II	MW-3-394-II
Sample Description:			
pH	NM	6.96	7.91
Conductivity	NM	640	1420
Temperature (°C)	NM	4.5	7.7
	Clear to slightly cloudy, tan color, no sheen, no odor	Clear to slightly cloudy, brown color, no sheen, no odor	Clear, colorless, no sheen, no odor
Parameters:	TCL VOCs	TCL VOCs	TCL VOCs

WELL PURGING AND SAMPLE COLLECTION SUMMARY LOG
GROUNDWATER ROUND II
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
LEICA INC.
CHEEKTOWAGA, NEW YORK
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Monitoring Well Number:	MW-5	*MW-13*	*MW-14*
Well Measurements			
Well Depth (Sounded) (below top of casing)	11.4 Ft.	10.60 Ft.	10.80 Ft.
Depth to Water Table (below top of casing)	4.5 Ft.	2.15 Ft.	1.85 Ft.
Height of Water Column	6.9 Ft.	8.45 Ft.	8.95 Ft.
Volume of Water in Well	1.10 Gallons	1.35 Gallons	1.43 Gallons
Water Removed per Volume	1.10 Gallons	1.4 Gallons	1.4 Gallons

Purge/Sample Record

MW-5

Purge Volume Number:	1	2	3	4	5
Volume Purged (Gal.):	1.1	1.1	1.1	1.1	1.1
pH (standard units):	8.22	8.12	7.92	8.65	8.48
Conductivity (mmho/cm):	190	240	440	380	510
Temperature (°C):	6.7	7.8	8.0	8.2	8.7

MW-13

Purge Volume Number:	1	2	3	4	5
Volume Purged (Gal.):	1.4	1.4	1.4	1.4	1.4
pH (standard units):	6.08	6.28	6.82	7.19	7.34
Conductivity (mmho/cm):	777	1286	1271	1272	1321
Temperature (°C):	6.4	7.7	8.4	7.9	8.1

MW-14

Purge Volume Number:	1	2	3
Volume Purged (Gal.):	1.4	1.4	1.4
pH (standard units):	7.20	7.19	7.38
Conductivity (mmho/cm):	1908	1909	1849
Temperature (°C):	6.8	8.2	8.4

	MW-5	MW-13	MW-14
Total Purge Volume:	5.5 Gallons	7.0 Gallons	4.5 Gallons
Sample Number:	MW-5-394-II	MW-13-394-II	MW-14-394-II
Sample Description:			
pH	8.39	7.08	7.74
Conductivity	490	1460	1874
Temperature (°C)	8.0	6.8	8.5
	Brown, cloudy, no odor, no sheen	Clear, no odor, no sheen	Some suspended solids, no sheen, no odor
Parameters:	TCL VOCs	TCL VOCs	TCL VOCs

WELL PURGING AND SAMPLE COLLECTION SUMMARY LOG
GROUNDWATER ROUND II
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Monitoring Well Number:	*MW-15*	*MW-16*	*MW-2A*
Well Measurements			
Well Depth (Sounded) (below top of casing)	11.20 Ft.	11.80 Ft.	29.9 Ft.
Depth to Water Table (below top of casing)	3.66 Ft.	5.93 Ft.	7.2 Ft.
Height of Water Column	7.54 Ft.	5.87 Ft.	22.7 Ft.
Volume of Water in Well	1.21 Gallons	0.94 Gallons	8.2 Gallons
Water Removed per Volume	1.2 Gallons	1.0 Gallons	8 Gallons

Purge/Sample Record

	MW-15					MW-16					MW-2A		
Purge Volume Number:	1	2	3	4	5	1	2	3	4	5	1	2	3
Volume Purged (Gal.):	1.2	1.2	1.2	1.2	1.2	pH Meter Failed.					8.0	8.0	8.0
pH (standard units):	5.53	6.60	7.50	7.83	8.11						6.75	6.80	6.93
Conductivity (mmho/cm):	230	210	410	460	290						590	620	620
Temperature (°C):	6.8	7.8	8.1	7.9	8.9						5.7	5.6	5.6

	MW-15	MW-16	MW-2A
Total Purge Volume:	6.0 Gallons	5.0 Gallons	24 Gallons
Sample Number:	MW-15-394-II and MS/MSD	MW-16-394-II	MW-2A-394-II
Sample Description:			
pH	8.60	NM	7.02
Conductivity	220	NM	630
Temperature (°C)	10.0	NM	5.2
	Slightly cloudy, brown, no sheen, no odor	Slightly cloudy, gray, trace dark floating particles, trace sheen, chemical odor	Clear to slightly cloudy, colorless, no sheen, no odor
Parameters:	TCL VOCs	TCL VOCs	TCL VOCs

WELL PURGING AND SAMPLE COLLECTION SUMMARY LOG
GROUNDWATER ROUND II
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LEICA INC.
CHEEKTOWAGA, NEW YORK
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Monitoring Well Number:	*MW-5A*	*MW-6A*	*MW-13A*
Well Measurements			
Well Depth (Sounded) (below top of casing)	42.0 Ft.	36.05 Ft.	45.0 Ft.
Depth to Water Table (below top of casing)	4.46 Ft.	9.68 Ft.	4.95 Ft.
Height of Water Column	37.54 Ft.	26.37 Ft.	39.05 Ft.
Volume of Water in Well	13.9 Gallons	12.0 Gallons	17.0 Gallons
Water Removed per Volume	14.0 Gallons	12.0 Gallons	17.0 Gallons

Purge/Sample Record

MW-5A

Purge Volume Number:	1	2	3	4	5
Volume Purged (Gal.):	14.0	14.0	14.0	14.0	14.0
pH (standard units):	6.88	7.42	7.48	6.61	NM
Conductivity (mmho/cm):	987	1110	1190	1450	1565
Temperature (°C):	11.9	12.7	11.0	11.6	11.3

MW-6A

Purge Volume Number:	1	2	3	4	5	6	7
Volume Purged (Gal.):	20	20	20	20	20	20	20
pH (standard units):	NM	NM	NM	6.23	6.63	6.70	6.73
Conductivity (mmho/cm):	NM	NM	NM	2120	2060	2050	2040
Temperature (°C):	NM	NM	NM	13.5	13.5	13.5	13.5

MW-13A

Purge Volume Number:	1	2	3	4	5
Volume Purged (Gal.):	17.0	17.0	17.0	17.0	17.0
pH (standard units):	6.49	6.75	7.03	7.36	7.65
Conductivity (mmho/cm):	1140	1107	1109	1118	1170
Temperature (°C):	11.2	11.9	13.4	13.6	14.2

Monitoring Well Number:	*MW-5A*	*MW-6A*	*MW-13A*
Total Purge Volume:	70 Gallons	150 Gallons	85 Gallons
Sample Number:	MW-5A-394-II	MW-6A-394-II	MW-13A-394-II
Sample Description:			
pH	NM	6.21	7.79
Conductivity	NM	1970	1120
Temperature (°C)	NM	12.8	10.3
	Cloudy, light brown, no sheen, no odor	Clear, slightly dark color, some sulfide odor	Slightly cloudy, some suspended solids, no sheen, sulfide odor
Parameters:	TCL VOCs	TCL VOCs	TCL VOCs

WELL PURGING AND SAMPLE COLLECTION SUMMARY LOG
GROUNDWATER ROUND II
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LEICA INC.
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Monitoring Well Number:	*MW-14A*	*MW-15A*
Well Measurements		
Well Depth (Sounded) (below top of casing)	36.0 Ft.	36.0 Ft.
Depth to Water Table (below top of casing)	5.07 Ft.	7.93 Ft.
Height of Water Column	30.93 Ft.	28.07 Ft.
Volume of Water in Well	11.44 Gallons	11.5 Gallons
Water Removed per Volume	12.0 Gallons	12 Gallons

Purge/Sample Record

MW-14A

Purge Volume Number:	1	2	3
Volume Purged (Gal.):	11.5	11.5	12
pH (standard units):	7.54	7.76	7.63
Conductivity (mmho/cm):	1232	1248	1390
Temperature (°C):	10.4	10.6	10.3

MW-15A

Purge Volume Number:	1	2	3	4	5
Volume Purged (Gal.):	20	20	20	20	20
pH (standard units):	-	5.60	6.17	6.70	6.85
Conductivity (mmho/cm):	-	3040	3020	3030	2980
Temperature (°C):	-	12.3	12.5	12.7	12.2

	MW-14A	*MW-15A*
Total Purge Volume:	35 Gallons	100 Gallons
Sample Number:	MW-14A-394-II	MW-15A-394-II and MS/MSD
Sample Description:		
pH	7.63	6.78
Conductivity	1390	2890
Temperature (°C)	10.3	12.4
	Clear, sulfide odor, no sheen	Clear, slight brown color, no sheen, sulfide odor
Parameters:	TCL VOCs	TCL VOCs

WELL PURGING AND SAMPLE COLLECTION SUMMARY LOG
GROUNDWATER ROUND II
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
LEICA INC.
CHEEKTOWAGA, NEW YORK
MARCH 1994

Notes:

MS/MSD	Matrix Spike/Matrix Spike Duplicate.
NM	Not Measured.
NYSDEC	New York State Department of Environmental Conservation.
TCL	Target Compound List.
VOC	Volatile Organic Compound.

WELL PURGING AND SAMPLE COLLECTION SUMMARY LOG
GROUNDWATER ROUND III
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
LEICA INC.
CHEEKTOWAGA, NEW YORK
APRIL 1994

Monitoring Well Number:	*MW-18*	*MW-19*	*MW-20*
Well Measurements			
Well Depth (Sounded) (below top of casing)	13.40 Ft.	13.90 Ft.	12.20 Ft.
Depth to Water Table (below top of casing)	11.20 Ft.	7.38 Ft.	3.52 Ft.
Height of Water Column	2.20 Ft.	6.52 Ft.	8.68 Ft.
Volume of Water in Well	0.35 Gallons	1.04 Gallons	1.39 Gallons
Water Removed per Volume	0.35 Gallons	1.0 Gallons	1.4 Gallons

Purge/Sample Record

	MW-18					MW-19					MW-20				
Purge Volume Number:	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Volume Purged (Gal.):	0.35	0.35	0.35	0.35	0.35	1.0	1.0	1.0	1.0	1.0	1.4	1.4	1.4	1.4	1.4
pH (standard units):	7.22	7.01	7.02	7.31	7.53	6.85	6.95	7.02	7.17	7.33	6.89	7.05	7.05	7.19	7.15
Conductivity (mmho/cm):	1630	1274	1375	14.0	1363	1490	1500	1580	1440	1480	1210	1180	1210	1220	1220
Temperature (°C):	11.8	12.1	12.2	12.2	12.0	9.6	10.3	10.1	10.2	11.0	9.2	9.2	9.4	9.4	9.6

	MW-18	MW-19	MW-20
Total Purge Volume:	1.75 Gallons	5.0 Gallons	7.0 Gallons
Sample Number:	MW-18-494-III and MS/MSD and NYSDEC Split Sample	MW-19-494-III	MW-20-494-III and Duplicate NYSDEC Split Sample
Sample Description:			
pH	6.21	7.30	7.21
Conductivity	1340	1520	1170
Temperature (°C)	NM	12.0	9.3
	Slightly cloudy, no sheen, no odor	Slightly cloudy, no sheen, no odor	Clear to very slightly cloudy, no sheen, no odor
Parameters:	TCL VOCs	TCL VOCs	TCL VOCs

WELL PURGING AND SAMPLE COLLECTION SUMMARY LOG
GROUNDWATER ROUND III
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
LEICA INC.
CHEEKTOWAGA, NEW YORK
APRIL 1994

Monitoring Well Number:	*MW-21*	*MW-22*	*MW-23*
Well Measurements			
Well Depth (Sounded) (below top of casing)	12.7 Ft.	10.50 Ft.	13.5 Ft.
Depth to Water Table (below top of casing)	6.96 Ft.	2.40 Ft.	3.1 Ft.
Height of Water Column	5.74 Ft.	8.10 Ft.	10.4 Ft.
Volume of Water in Well	0.92 Gallons	1.30 Gallons	1.6 Gallons
Water Removed per Volume	1.0 Gallons	1.30 Gallons	1.6 Gallons

Purge/Sample Record

Monitoring Well Number:	*MW-21*				*MW-22*					*MW-23*				
Purge Volume Number:	1	2	3	4	1	2	3	4	5	1	2	3	4	5
Volume Purged (Gal.):	1.0	1.0	1.0	1.0	1.3	1.3	1.3	1.3	1.3	1.6	1.6	1.6	1.6	1.6
pH (standard units):	6.93	7.08	7.20	7.27	7.31	7.16	7.19	7.40	7.34	7.48	7.27	7.24	7.56	7.35
Conductivity (mmho/cm):	1480	1750	1690	1770	1570	1580	1520	550	1530	1210	1180	1180	1190	1180
Temperature (°C):	9.6	9.4	10.2	10.1	8.2	7.8	8.3	8.0	8.0	7.9	8.0	8.1	8.0	8.0

Monitoring Well Number:	*MW-21*	*MW-22*	*MW-23*
Total Purge Volume:	4.0 Gallons	6.5 Gallons	8.0 Gallons
Sample Number:	MW-21-494-III and NYSDEC Split Sample	MW-22-494-III and NYSDEC Split Sample	MW-23-494-III and NYSDEC Split Sample
Sample Description:			
pH	7.26	7.20	7.34
Conductivity	1790	1450	1080
Temperature (°C)	10.6	8.4	8.20
	Slightly cloudy, light brown color, no sheen, no odor	Clear to slightly cloudy, no odor, no sheen	Clear, colorless, no sheen, no odor
Parameters:	TCL VOCs	TCL VOCs	TCL VOCs

WELL PURGING AND SAMPLE COLLECTION SUMMARY LOG
GROUNDWATER ROUND III
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
LEICA INC.
CHEEKTOWAGA, NEW YORK
APRIL 1994

Monitoring Well Number:	*MW-1A*	*MW-16A*	*MW-17A*
Well Measurements			
Well Depth (Sounded) (below top of casing)	39.4 Ft.	40.0 Ft.	40.0 Ft.
Depth to Water Table (below top of casing)	13.4 Ft.	10.0 Ft.	2.6 Ft.
Height of Water Column	26.0 Ft.	30.0 Ft.	37.4 Ft.
Volume of Water in Well	8.9 Gallons	45.0 Gallons	17.0 Gallons
Water Removed per Volume	9.0 Gallons	45.0 Gallons	17.0 Gallons

Purge/Sample Record

	MW-1A					MW-16A					MW-17A				
Purge Volume Number:	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Volume Purged (Gal.):	9.0	9.0	9.0	9.0	9.0	50	50	50	50	50	17.0	17.0	17.0	17.0	17.0
pH (standard units):	NM	NM	NM	NM	NM	6.42	6.40	6.48	6.43	6.51	7.24	7.37	7.02	NM	6.93
Conductivity (mmho/cm):	1925	1186	1213	1268	1240	2100	2240	2000	2220	1970	1105	1098	1086	1116	1118
Temperature (°C):	12.6	13.3	13.1	13.4	13.1	13.0	12.8	12.9	13.9	13.4	11.6	12.1	12.8	13.4	13.5

	MW-1A	MW-16A	MW-17A
Total Purge Volume:	45 Gallons	250 Gallons	85 Gallons
Sample Number:	MW-1A-494-III	MW-16A-494-III	MW-17A-494-III
Sample Description:			
pH	NM	6.47	6.94
Conductivity	1260	2050	1118
Temperature (°C)	13.0	12.9	13.3
	Clear, no sheen, no odor	Odor, sheen, gray color, slightly cloudy	Clear, no sheen, no odor
Parameters:	TCL VOCs	TCL VOCs	TCL VOCs

WELL PURGING AND SAMPLE COLLECTION SUMMARY LOG
GROUNDWATER ROUND III
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
LEICA INC.
CHEEKTOWAGA, NEW YORK
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Notes:

MS/MSD	Matrix Spike/Matrix Spike Duplicate.
NM	Not Measured.
NYSDEC	New York State Department of Environmental Conservation.
TAL	Target Analyte List.
VOC	Volatile Organic Compound.

G

APPENDIX G

RISK CALCULATION TABLES

TABLE : 1

EXPOSURE SCENARIO FORMULA AND ASSUMPTIONS

EXPOSURE SCENARIO : CEMETARY WORKER
SITE : LEICA SITE
SECTOR : SECTOR A SOIL
LOCATION : ON-SITE

$$\text{EQUATION : INTAKE (mg/kg-day)} = \frac{CS \times CF \times SA \times AF \times MF \times ABS \times EF \times ED}{AT \times BW} + \frac{CS \times IR \times ABS \times CF \times EF \times ED}{AT \times BW} \times PTF$$

where :
CS = Chemical Concentration in Soil (mg/kg)
IR = Ingestion Rate (mg soil/day)
SA = Skin Surface Area Available for Contact (cm2/event)
CF = Conversion Factor (10E-06 kg/mg)
EF = Exposure Frequency (days/years)
ED = Exposure Duration (years)
BW = Body Weight (kg)
AT = Averaging Time (period over which exposure is averaged -- days)
AF = Soil to Skin Adherence Factor (mg/cm2)
ABS = Absorption Factor (unitless)
MF = Matrix Factor; part of chemical on soil that is in contact with skin (%/100)
PTF = Percent of Time Factor: Percent of time in contaminated area. (%/100)

VARIABLE	MEAN	RME	REFERENCES
CS (mg/kg)	MEAN	95% UCL	RAGS (1,2)
IR - ADULT (mg/exposure)	50	50	RAGS (1,2)
SA - ADULT (cm2)	5300	5300	DEAP (3)
CF (kg/mg)	0.000001	0.000001	RAGS (1,2)
EF (days/year)	5	20	PROFESSIONAL JUDGEMENT
ED - ADULT (CARCINOGEN) (yrs)	10	25	RAGS (1,2)
ED (NON-CARCINOGEN) (yrs)	1	1	RAGS (1,2)
BW - ADULT (kg)	70	70	RAGS (1,2)
AT (CARCINOGEN) (yrs x days /yr)	25550	25550	RAGS (1,2)
AT (NON - CARCINOGEN) (yrs x days /yr)	365	365	RAGS (1,2)
AF (mg/cm2)	0.2	1	DEAP (3)
MF	0.15	0.15	HAWLEY (4)
ABS ORAL (CHEMICAL SPECIFIC)			
DERMAL (CHEMICAL SPECIFIC)			
PTF	1	1	PROFESSIONAL JUDGEMENT

NOTE :
(1) EPA "RISK ASSESSMENT GUIDANCE FOR SUPERFUND MANUAL, DECEMBER 1989, EPA/540/1-89/002.
(2) SUPPLEMENTAL GUIDANCE: "STANDARD DEFAULT EXPOSRE FACTORS", OSWER DIRECTIVE: 9285.6-03, MARCH 25, 1991.
(3) EPA DERMAL EXPOSURE ASSESSMENT: PRINCIPLES AND APPLICATIONS, EPA/600/8-89/011B, JANUARY 1992.
(4) HAWLEY, J.K., "ASSESSMENT OF HEALTH RISK FROM EXPOSURE TO CONTAMINATED SOIL", RISK ANALYSIS, VOL.5 NO.4, 1985.

TABLE : 2

MEDIA CONCENTRATIONS/CONSTANTS

EXPOSURE SCENARIO : CEMETARY WORKER
SITE : LEICA SITE
SECTOR : SECTOR A SOIL
LOCATION : ON-SITE

	MEDIA CONCENTRATION				ORAL BIOAVAIL. FACTOR		DERMAL BIOAVAIL. FACTOR	
PARAMETER	MEAN mg/kg	RME mg/kg	ORAL CSF 1/(mg/kg/d)	ORAL RfD mg/kg/d	MEAN %/100	RME %/100	MEAN %/100	RME %/100
VOCs								
ACETONE	1.36E-02	2.50E-02	NA	1.00E-01	1	1	0.25	0.25
BROMOMETHANE	6.27E-03	3.00E-03	NA	1.40E-03	1	1	0.25	0.25
2-BUTANONE	7.09E-03	9.00E-03	NA	6.00E-01	1	1	0.25	0.25
CARBON DISULFIDE	6.09E-03	2.00E-03	NA	1.00E-01	1	1	0.25	0.25
1,2-DICHLOROETHENE (TOTAL)	3.95E-02	7.91E-02	NA	9.00E-03	1	1	0.25	0.25
ETHYLBENZENE	1.01E-02	1.75E-02	NA	1.00E-01	1	1	0.25	0.25
2-HEXANONE	6.82E-03	6.00E-03	NA	NA	1	1	0.25	0.25
METHYLENE CHLORIDE	6.23E-03	2.00E-03	7.50E-03	6.00E-02	1	1	0.25	0.25
TOLUENE	9.36E-03	1.63E-02	NA	2.00E-01	1	1	0.25	0.25
TRICHLOROETHENE	1.92E-02	4.83E-02	NA	NA	1	1	0.25	0.25
VINYL CHLORIDE	1.01E-02	1.75E-02	1.90E+00	NA	1	1	0.25	0.25
XYLENES (TOTAL)	2.35E-02	6.07E-02	NA	2.00E+00	1	1	0.25	0.25
SVOCs								
ACENAPHTHENE	2.94E-01	5.60E-01	NA	6.00E-02	1	1	0.1	0.1
ACENAPHTHYLENE	2.36E-01	3.30E-01	NA	NA	1	1	0.1	0.1
ANTHRACENE	5.29E-01	1.50E+00	NA	3.00E-01	1	1	0.1	0.1
BENZO (a) ANTHRACENE	2.25E+00	8.40E+00	7.30E-01	NA	1	1	0.1	0.1
BENZO (b) FLUORANTHENE	6.15E+00	2.40E+01	7.30E-01	NA	1	1	0.1	0.1
BENZO (k) FLUORANTHENE	2.90E+00	1.10E+01	7.30E-02	NA	1	1	0.1	0.1
BENZO (g,h,i) PERYLENE	1.25E+00	4.40E+00	NA	NA	1	1	0.1	0.1
BENZO (a) PYRENE	3.15E+00	1.20E+01	7.30E+00	NA	1	1	0.1	0.1
BIS (2-ETHYLHEXYL) PHTHALATE	2.13E+00	7.70E+00	1.40E-02	2.00E-02	1	1	0.1	0.1
BUTYL BENZYL PHTHALATE	3.04E-01	6.00E-01	NA	2.00E-01	1	1	0.1	0.1
CARBAZOLE	1.45E+00	5.20E+00	2.00E-02	NA	1	1	0.1	0.1
CHRYSENE	2.18E+00	8.10E+00	7.30E-03	NA	1	1	0.1	0.1
DIBENZO (a,h) ANTHRACENE	6.79E-01	2.10E+00	7.30E+00	NA	1	1	0.1	0.1
DIBENZOFURAN	4.54E-01	1.20E+00	NA	NA	1	1	0.1	0.1
DI-n-BUTYL PHTHALATE	2.34E-01	3.20E-01	NA	1.00E-01	1	1	0.1	0.1
FLUORANTHENE	6.36E+00	2.50E+01	NA	4.00E-02	1	1	0.1	0.1
FLUORENE	3.19E-01	6.60E-01	NA	4.00E-02	1	1	0.1	0.1
INDENO (1,2,3-cd) PYRENE	1.33E+00	4.70E+00	7.30E-01	NA	1	1	0.1	0.1
2-METHYLNAPHTHALENE	1.03E+00	3.50E+00	NA	NA	1	1	0.1	0.1
NAPHTHALENE	8.29E-01	2.70E+00	NA	NA	1	1	0.1	0.1
PHENANTHRENE	3.40E+00	1.30E+01	NA	NA	1	1	0.1	0.1
PYRENE	4.60E+00	1.80E+01	NA	3.00E-02	1	1	0.1	0.1
METALS								
ALUMINIUM	1.38E+04	1.81E+04	NA	NA	1	1	0.01	0.01
ARSENIC	1.58E+01	4.28E+01	1.75E+00	3.00E-04	1	1	0.01	0.01
BARIUM	2.16E+02	4.03E+02	NA	7.00E-02	1	1	0.01	0.01
BERYLLIUM	4.48E-01	7.17E-01	4.30E+00	5.00E-03	1	1	0.01	0.01
CADMIUM	2.14E+00	4.46E+00	NA	5.00E-04	1	1	0.01	0.01
CALCIUM	3.76E+04	6.21E+04	NA	NA	1	1	0.01	0.01
CHROMIUM	2.97E+01	5.09E+01	NA	NA	1	1	0.01	0.01
COBALT	9.86E+00	1.31E+01	NA	NA	1	1	0.01	0.01
COPPER	4.84E+01	1.16E+02	NA	3.70E-02	1	1	0.01	0.01
IRON	2.20E+04	2.88E+04	NA	NA	1	1	0.01	0.01
LEAD	2.57E+02	7.18E+02	NA	1.40E-03	1	1	0.01	0.01
MAGNESIUM	1.41E+04	2.09E+04	NA	NA	1	1	0.01	0.01
MANGANESE	5.23E+02	7.37E+02	NA	5.00E-03	1	1	0.01	0.01
MERCURY	1.94E-01	4.69E-01	NA	NA	1	1	0.01	0.01
NICKEL	3.10E+01	5.33E+01	NA	2.00E-02	1	1	0.01	0.01
POTASSIUM	2.03E+03	2.59E+03	NA	NA	1	1	0.01	0.01
SELENIUM	3.40E-01	8.19E-01	NA	5.00E-03	1	1	0.01	0.01
SODIUM	1.56E+02	2.53E+02	NA	NA	1	1	0.01	0.01
THALLIUM	2.57E-01	3.83E-01	NA	7.00E-05	1	1	0.01	0.01
VANADIUM	3.01E+01	4.29E+01	NA	7.00E-03	1	1	0.01	0.01
ZINC	2.55E+02	6.16E+02	NA	3.00E-01	1	1	0.01	0.01

TABLE : 3

EXPOSURE, RISK AND HAZARD CALCULATIONS

EXPOSURE SCENARIO : CEMETARY WORKER
SITE : LEICA SITE
SECTOR : SECTOR A SOIL
LOCATION : ON-SITE

	LIFETIME AVERAGE DAILY INTAKE (mg/kg/day)		LIFETIME UPPER BOUND EXCESS CANCER RISK		ANNUAL AVERAGE DAILY INTAKE (mg/kg/day)		HAZARD QUOTIENT CDI/RfD	
PARAMETER	MEAN	RME	MEAN	RME	MEAN	RME	MEAN	RME
VOCs								
ACETONE	3.41E-11	1.74E-09	0.00E+00	0.00E+00	2.39E-10	4.87E-09	2.39E-09	4.87E-08
BROMOMETHANE	1.57E-11	2.09E-10	0.00E+00	0.00E+00	1.10E-10	5.84E-10	7.87E-08	4.17E-07
2-BUTANONE	1.78E-11	6.26E-10	0.00E+00	0.00E+00	1.25E-10	1.75E-09	2.08E-10	2.92E-09
CARBON DISULFIDE	1.53E-11	1.39E-10	0.00E+00	0.00E+00	1.07E-10	3.89E-10	1.07E-09	3.89E-09
1,2-DICHLOROETHENE (TOTAL)	9.91E-11	5.50E-09	0.00E+00	0.00E+00	6.94E-10	1.54E-08	7.71E-08	1.71E-06
ETHYLBENZENE	2.53E-11	1.22E-09	0.00E+00	0.00E+00	1.77E-10	3.41E-09	1.77E-09	3.41E-08
2-HEXANONE	1.71E-11	4.17E-10	0.00E+00	0.00E+00	1.20E-10	1.17E-09	0.00E+00	0.00E+00
METHYLENE CHLORIDE	1.56E-11	1.39E-10	1.17E-13	1.04E-12	1.09E-10	3.89E-10	1.82E-09	6.49E-09
TOLUENE	2.35E-11	1.13E-09	0.00E+00	0.00E+00	1.64E-10	3.17E-09	8.22E-10	1.59E-08
TRICHLOROETHENE	4.82E-11	3.36E-09	0.00E+00	0.00E+00	3.37E-10	9.40E-09	0.00E+00	0.00E+00
VINYL CHLORIDE	2.53E-11	1.22E-09	4.81E-11	2.31E-09	1.77E-10	3.41E-09	0.00E+00	0.00E+00
XYLENES (TOTAL)	5.90E-11	4.22E-09	0.00E+00	0.00E+00	4.13E-10	1.18E-08	2.06E-10	5.91E-09
SVOCs								
ACENAPHTHENE	5.42E-10	2.03E-08	0.00E+00	0.00E+00	3.79E-09	5.68E-08	6.32E-08	9.46E-07
ACENAPHTHYLENE	4.35E-10	1.19E-08	0.00E+00	0.00E+00	3.04E-09	3.35E-08	0.00E+00	0.00E+00
ANTHRACENE	9.75E-10	5.43E-08	0.00E+00	0.00E+00	6.82E-09	1.52E-07	2.27E-08	5.07E-07
BENZO (a) ANTHRACENE	4.15E-09	3.04E-07	3.03E-09	2.22E-07	2.90E-08	8.52E-07	0.00E+00	0.00E+00
BENZO (b) FLUORANTHENE	1.13E-08	8.69E-07	8.27E-09	6.34E-07	7.93E-08	2.43E-06	0.00E+00	0.00E+00
BENZO (k) FLUORANTHENE	5.34E-09	3.98E-07	3.90E-10	2.91E-08	3.74E-08	1.12E-06	0.00E+00	0.00E+00
BENZO (g,h,i) PERYLENE	2.30E-09	1.59E-07	0.00E+00	0.00E+00	1.61E-08	4.46E-07	0.00E+00	0.00E+00
BENZO (a) PYRENE	5.80E-09	4.34E-07	4.24E-08	3.17E-06	4.06E-08	1.22E-06	0.00E+00	0.00E+00
BIS (2-ETHYLHEXYL) PHTHALATE	3.92E-09	2.79E-07	5.49E-11	3.90E-09	2.75E-08	7.81E-07	1.37E-06	3.90E-05
BUTYL BENZYL PHTHALATE	5.60E-10	2.17E-08	0.00E+00	0.00E+00	3.92E-09	6.08E-08	1.96E-08	3.04E-07
CARBAZOLE	2.67E-09	1.88E-07	5.34E-11	3.77E-09	1.87E-08	5.27E-07	0.00E+00	0.00E+00
CHRYSENE	4.02E-09	2.93E-07	2.93E-11	2.14E-09	2.81E-08	8.21E-07	0.00E+00	0.00E+00
DIBENZO (a,h) ANTHRACENE	1.25E-09	7.60E-08	9.13E-09	5.55E-07	8.76E-09	2.13E-07	0.00E+00	0.00E+00
DIBENZOFURAN	8.36E-10	4.34E-08	0.00E+00	0.00E+00	5.85E-09	1.22E-07	0.00E+00	0.00E+00
DI-n-BUTYL PHTHALATE	4.31E-10	1.16E-08	0.00E+00	0.00E+00	3.02E-09	3.24E-08	3.02E-08	3.24E-07
FLUORANTHENE	1.17E-08	9.05E-07	0.00E+00	0.00E+00	8.20E-08	2.53E-06	2.05E-06	6.34E-05
FLUORENE	5.88E-10	2.39E-08	0.00E+00	0.00E+00	4.11E-09	6.69E-08	1.03E-07	1.67E-06
INDENO (1,2,3-cd) PYRENE	2.45E-09	1.70E-07	1.79E-09	1.24E-07	1.72E-08	4.76E-07	0.00E+00	0.00E+00
2-METHYLNAPHTHALENE	1.90E-09	1.27E-07	0.00E+00	0.00E+00	1.33E-08	3.55E-07	0.00E+00	0.00E+00
NAPHTHALENE	1.53E-09	9.77E-08	0.00E+00	0.00E+00	1.07E-08	2.74E-07	0.00E+00	0.00E+00
PHENANTHRENE	6.26E-09	4.71E-07	0.00E+00	0.00E+00	4.38E-08	1.32E-06	0.00E+00	0.00E+00
PYRENE	8.47E-09	6.52E-07	0.00E+00	0.00E+00	5.93E-08	1.82E-06	1.98E-06	6.08E-05
METALS								
ALUMINUM	1.99E-05	2.93E-04	0.00E+00	0.00E+00	1.39E-04	8.21E-04	0.00E+00	0.00E+00
ARSENIC	2.28E-08	6.93E-07	3.99E-08	1.21E-06	1.60E-07	1.94E-06	5.32E-04	6.47E-03
BARIUM	3.12E-07	6.53E-06	0.00E+00.	0.00E+00	2.18E-06	1.83E-05	3.12E-05	2.61E-04
BERYLLIUM	6.46E-10	1.16E-08	2.78E-09	4.99E-08	4.52E-09	3.25E-08	9.05E-07	6.50E-06
CADMIUM	3.09E-09	7.23E-08	0.00E+00	0.00E+00	2.16E-08	2.02E-07	4.32E-05	4.05E-04
CALCIUM	5.42E-05	1.01E-03	0.00E+00	0.00E+00	3.80E-04	2.82E-03	0.00E+00	0.00E+00
CHROMIUM	4.28E-08	8.25E-07	0.00E+00	0.00E+00	3.00E-07	2.31E-06	0.00E+00	0.00E+00
COBALT	1.42E-08	2.12E-07	0.00E+00	0.00E+00	9.95E-08	5.94E-07	0.00E+00	0.00E+00
COPPER	6.98E-08	1.88E-06	0.00E+00	0.00E+00	4.89E-07	5.26E-06	1.32E-05	1.42E-04
IRON	3.17E-05	4.67E-04	0.00E+00	0.00E+00	2.22E-04	1.31E-03	0.00E+00	0.00E+00
LEAD	3.71E-07	1.16E-05	0.00E+00	0.00E+00	2.59E-06	3.26E-05	1.85E-03	2.33E-02
MAGNESIUM	2.03E-05	3.39E-04	0.00E+00	0.00E+00	1.42E-04	9.48E-04	0.00E+00	0.00E+00
MANGANESE	7.54E-07	1.19E-05	0.00E+00	0.00E+00	5.28E-06	3.34E-05	1.06E-03	6.69E-03
MERCURY	2.80E-10	7.60E-09	0.00E+00	0.00E+00	1.96E-09	2.13E-08	0.00E+00	0.00E+00
NICKEL	4.47E-08	8.63E-07	0.00E+00	0.00E+00	3.13E-07	2.42E-06	1.56E-05	1.21E-04
POTASSIUM	2.93E-06	4.20E-05	0.00E+00	0.00E+00	2.05E-05	1.17E-04	0.00E+00	0.00E+00
SELENIUM	4.90E-10	1.33E-08	0.00E+00	0.00E+00	3.43E-09	3.72E-08	6.87E-07	7.43E-06
SODIUM	2.25E-07	4.10E-06	0.00E+00	0.00E+00	1.57E-06	1.15E-05	0.00E+00	0.00E+00
THALLIUM	3.71E-10	6.20E-09	0.00E+00	0.00E+00	2.59E-09	1.74E-08	3.71E-05	2.48E-04
VANADIUM	4.34E-08	6.95E-07	0.00E+00	0.00E+00	3.04E-07	1.95E-06	4.34E-05	2.78E-04
ZINC	3.68E-07	9.98E-06	0.00E+00	0.00E+00	2.57E-06	2.79E-05	8.58E-06	9.31E-05
	TOTAL ADDITIONAL ESTIMATED CANCER RISKS :						**HAZARD INDEX :**	
			1.08E-07	6.01E-06			3.64E-03	3.82E-02

TABLE : 4

SUMMARY TABLE

EXPOSURE SCENARIO : CEMETARY WORKER
SITE : LEICA SITE
SECTOR : SECTOR A SOIL
LOCATION : ON-SITE

	MEDIA CONCENTRATION		LIFETIME UPPER BOUND EXCESS CANCER RISK		HAZARD QUOTIENT CDI/RfD	
PARAMETER	MEAN mg/kg	RME mg/kg	MEAN	RME	MEAN	RME
VOCs						
ACETONE	1.36E-02	2.50E-02	0.00E+00	0.00E+00	2.39E-09	4.87E-08
BROMOMETHANE	6.27E-03	3.00E-03	0.00E+00	0.00E+00	7.87E-08	4.17E-07
2-BUTANONE	7.09E-03	9.00E-03	0.00E+00	0.00E+00	2.08E-10	2.92E-09
CARBON DISULFIDE	6.09E-03	2.00E-03	0.00E+00	0.00E+00	1.07E-09	3.89E-09
1,2-DICHLOROETHENE (TOTAL)	3.95E-02	7.91E-02	0.00E+00	0.00E+00	7.71E-08	1.71E-06
ETHYLBENZENE	1.01E-02	1.75E-02	0.00E+00	0.00E+00	1.77E-09	3.41E-08
2-HEXANONE	6.82E-03	6.00E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00
METHYLENE CHLORIDE	6.23E-03	2.00E-03	1.17E-13	1.04E-12	1.82E-09	6.49E-09
TOLUENE	9.36E-03	1.63E-02	0.00E+00	0.00E+00	8.22E-10	1.59E-08
TRICHLOROETHENE	1.92E-02	4.83E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00
VINYL CHLORIDE	1.01E-02	1.75E-02	4.81E-11	2.31E-09	0.00E+00	0.00E+00
XYLENES (TOTAL)	2.35E-02	6.07E-02	0.00E+00	0.00E+00	2.06E-10	5.91E-09
SVOCs						
ACENAPHTHENE	2.94E-01	5.60E-01	0.00E+00	0.00E+00	6.32E-08	9.46E-07
ACENAPHTHYLENE	2.36E-01	3.30E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ANTHRACENE	5.29E-01	1.50E+00	0.00E+00	0.00E+00	2.27E-08	5.07E-07
BENZO (a) ANTHRACENE	2.25E+00	8.40E+00	3.03E-09	2.22E-07	0.00E+00	0.00E+00
BENZO (b) FLUORANTHENE	6.15E+00	2.40E+01	8.27E-09	6.34E-07	0.00E+00	0.00E+00
BENZO (k) FLUORANTHENE	2.90E+00	1.10E+01	3.90E-10	2.91E-08	0.00E+00	0.00E+00
BENZO (g,h,i) PERYLENE	1.25E+00	4.40E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BENZO (a) PYRENE	3.15E+00	1.20E+01	4.24E-08	3.17E-06	0.00E+00	0.00E+00
BIS (2-ETHYLHEXYL) PHTHALATE	2.13E+00	7.70E+00	5.49E-11	3.90E-09	1.37E-06	3.90E-05
BUTYL BENZYL PHTHALATE	3.04E-01	6.00E-01	0.00E+00	0.00E+00	1.96E-08	3.04E-07
CARBAZOLE	1.45E+00	5.20E+00	5.34E-11	3.77E-09	0.00E+00	0.00E+00
CHRYSENE	2.18E+00	8.10E+00	2.93E-11	2.14E-09	0.00E+00	0.00E+00
DIBENZO (a,h) ANTHRACENE	6.79E-01	2.10E+00	9.13E-09	5.55E-07	0.00E+00	0.00E+00
DIBENZOFURAN	4.54E-01	1.20E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
DI-n-BUTYL PHTHALATE	2.34E-01	3.20E-01	0.00E+00	0.00E+00	3.02E-08	3.24E-07
FLUORANTHENE	6.36E+00	2.50E+01	0.00E+00	0.00E+00	2.05E-06	6.34E-05
FLUORENE	3.19E-01	6.60E-01	0.00E+00	0.00E+00	1.03E-07	1.67E-06
INDENO (1,2,3-cd) PYRENE	1.33E+00	4.70E+00	1.79E-09	1.24E-07	0.00E+00	0.00E+00
2-METHYLNAPHTHALENE	1.03E+00	3.50E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NAPHTHALENE	8.29E-01	2.70E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PHENANTHRENE	3.40E+00	1.30E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PYRENE	4.60E+00	1.80E+01	0.00E+00	0.00E+00	1.98E-06	6.08E-05
METALS						
ALUMINUM	1.38E+04	1.81E+04	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ARSENIC	1.58E+01	4.28E+01	3.99E-08	1.21E-06	5.32E-04	6.47E-03
BARIUM	2.16E+02	4.03E+02	0.00E+00	0.00E+00	3.12E-05	2.61E-04
BERYLLIUM	4.48E-01	7.17E-01	2.78E-09	4.99E-08	9.05E-07	6.50E-06
CADMIUM	2.14E+00	4.46E+00	0.00E+00	0.00E+00	4.32E-05	4.05E-04
CALCIUM	3.76E+04	6.21E+04	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHROMIUM	2.97E+01	5.09E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00
COBALT	9.86E+00	1.31E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00
COPPER	4.84E+01	1.16E+02	0.00E+00	0.00E+00	1.32E-05	1.42E-04
IRON	2.20E+04	2.88E+04	0.00E+00	0.00E+00	0.00E+00	0.00E+00
LEAD	2.57E+02	7.18E+02	0.00E+00	0.00E+00	1.85E-03	2.33E-02
MAGNESIUM	1.41E+04	2.09E+04	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MANGANESE	5.23E+02	7.37E+02	0.00E+00	0.00E+00	1.06E-03	6.69E-03
MERCURY	1.94E-01	4.69E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NICKEL	3.10E+01	5.33E+01	0.00E+00	0.00E+00	1.56E-05	1.21E-04
POTASSIUM	2.03E+03	2.59E+03	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SELENIUM	3.40E-01	8.19E-01	0.00E+00	0.00E+00	6.87E-07	7.43E-06
SODIUM	1.56E+02	2.53E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00
THALLIUM	2.57E-01	3.83E-01	0.00E+00	0.00E+00	3.71E-05	2.48E-04
VANADIUM	3.01E+01	4.29E+01	0.00E+00	0.00E+00	4.34E-05	2.78E-04
ZINC	2.55E+02	6.16E+02	0.00E+00	0.00E+00	8.58E-06	9.31E-05
	TOTAL ADDITIONAL ESTIMATED CANCER RISKS				HAZARD INDEX :	
			1.08E-07	6.01E-06	3.64E-03	3.82E-02

TABLE : 5

EXPOSURE SCENARIO FORMULA AND ASSUMPTIONS

EXPOSURE SCENARIO : TRESPASSER
SITE : LEICA SITE
SECTOR : SECTOR A SOIL
LOCATION : ON-SITE

$$\text{EQUATION : INTAKE (mg/kg-day)} = \frac{CS \times CF \times SA \times AF \times MF \times ABS \times EF \times ED}{AT \times BW} + \frac{CS \times IR \times ABS \times CF \times EF \times ED}{AT \times BW} \times PTF$$

where :
CS = Chemical Concentration in Soil (mg/kg)
IR = Ingestion Rate (mg soil/day)
SA = Skin Surface Area Available for Contact (cm2/event)
CF = Conversion Factor (10E-06 kg/mg)
EF = Exposure Frequency (days/years)
ED = Exposure Duration (years)
BW = Body Weight (kg)
AT = Averaging Time (period over which exposure is averaged -- days)
AF = Soil to Skin Adherence Factor (mg/cm2)
ABS = Absorption Factor (unitless)
MF = Matrix Factor; part of chemical on soil that is in contact with skin (%/100)
PTF = Percent of Time Factor: Percent of time in contaminated area. (%/100)

VARIABLE	MEAN	RME	REFERENCES
CS (mg/kg)	MEAN	95% UCL	RAGS (1,2)
IR - CHILD (mg/exposure)	200	200	RAGS (1,2)
SA - CHILD (cm2)	1325	1325	DEAP (3)
CF (kg/mg)	0.000001	0.000001	RAGS (1,2)
EF (days/year)	24	48	PROFESSIONAL JUDGEMENT
ED - CHILD (CARCINOGEN) (yrs)	5	5	RAGS (1,2)
ED (NON-CARCINOGEN) (yrs)	1	1	RAGS (1,2)
BW - CHILD (kg)	16	16	RAGS (1,2)
AT (CARCINOGEN) (yrs x days /yr)	25550	25550	RAGS (1,2)
AT (NON - CARCINOGEN) (yrs x days /yr)	365	365	RAGS (1,2)
AF (mg/cm2)	0.2	1	DEAP (3)
MF	0.15	0.15	HAWLEY (4)
ABS ORAL (CHEMICAL SPECIFIC)			
DERMAL (CHEMICAL SPECIFIC)			
PTF	1	1	PROFESSIONAL JUDGEMENT

NOTE :
(1) EPA "RISK ASSESSMENT GUIDANCE FOR SUPERFUND MANUAL, DECEMBER 1989, EPA/540/1-89/002.
(2) SUPPLEMENTAL GUIDANCE: "STANDARD DEFAULT EXPOSRE FACTORS", OSWER DIRECTIVE: 9285.6-03, MARCH 25, 1991.
(3) EPA DERMAL EXPOSURE ASSESSMENT: PRINCIPLES AND APPLICATIONS, EPA/600/8-89/011B, JANUARY 1992.
(4) HAWLEY, J.K., "ASSESSMENT OF HEALTH RISK FROM EXPOSURE TO CONTAMINATED SOIL", RISK ANALYSIS, VOL.5 NO.4, 1985.

TABLE : 6

MEDIA CONCENTRATIONS/CONSTANTS

EXPOSURE SCENARIO : TRESPASSER-CHILD
SITE : LEICA SITE
SECTOR : SECTOR A SOIL
LOCATION : ON-SITE

	MEDIA CONCENTRATION				ORAL BIOAVAIL. FACTOR		DERMAL BIOAVAIL. FACTOR	
PARAMETER	MEAN mg/kg	RME mg/kg	ORAL CSF 1/(mg/kg/d)	ORAL RfD mg/kg/d	MEAN %/100	RME %/100	MEAN %/100	RME %/100
VOCs								
ACETONE	1.36E-02	2.50E-02	NA	1.00E-01	1	1	0.25	0.25
BROMOMETHANE	6.27E-03	3.00E-03	NA	1.40E-03	1	1	0.25	0.25
2-BUTANONE	7.09E-03	9.00E-03	NA	6.00E-01	1	1	0.25	0.25
CARBON DISULFIDE	6.09E-03	2.00E-03	NA	1.00E-01	1	1	0.25	0.25
1,2-DICHLOROETHENE (TOTAL)	3.95E-02	7.91E-02	NA	9.00E-03	1	1	0.25	0.25
ETHYLBENZENE	1.01E-02	1.75E-02	NA	1.00E-01	1	1	0.25	0.25
2-HEXANONE	6.82E-03	6.00E-03	NA	NA	1	1	0.25	0.25
METHYLENE CHLORIDE	6.23E-03	2.00E-03	7.50E-03	6.00E-02	1	1	0.25	0.25
TOLUENE	9.36E-03	1.63E-02	NA	2.00E-01	1	1	0.25	0.25
TRICHLOROETHENE	1.92E-02	4.83E-02	NA	NA	1	1	0.25	0.25
VINYL CHLORIDE	1.01E-02	1.75E-02	1.90E+00	NA	1	1	0.25	0.25
XYLENES (TOTAL)	2.35E-02	6.07E-02	NA	2.00E+00	1	1	0.25	0.25
SVOCs								
ACENAPHTHENE	2.94E-01	5.60E-01	NA	6.00E-02	1	1	0.1	0.1
ACENAPHTHYLENE	2.36E-01	3.30E-01	NA	NA	1	1	0.1	0.1
ANTHRACENE	5.29E-01	1.50E+00	NA	3.00E-01	1	1	0.1	0.1
BENZO (a) ANTHRACENE	2.25E+00	8.40E+00	7.30E-01	NA	1	1	0.1	0.1
BENZO (b) FLUORANTHENE	6.15E+00	2.40E+01	7.30E-01	NA	1	1	0.1	0.1
BENZO (k) FLUORANTHENE	2.90E+00	1.10E+01	7.30E-02	NA	1	1	0.1	0.1
BENZO (g,h,i) PERYLENE	1.25E+00	4.40E+00	NA	NA	1	1	0.1	0.1
BENZO (a) PYRENE	3.15E+00	1.20E+01	7.30E+00	NA	1	1	0.1	0.1
BIS (2-ETHYLHEXYL) PHTHALATE	2.13E+00	7.70E+00	1.40E-02	2.00E-02	1	1	0.1	0.1
BUTYL BENZYL PHTHALATE	3.04E-01	6.00E-01	NA	2.00E-01	1	1	0.1	0.1
CARBAZOLE	1.45E+00	5.20E+00	2.00E-02	NA	1	1	0.1	0.1
CHRYSENE	2.18E+00	8.10E+00	7.30E-03	NA	1	1	0.1	0.1
DIBENZO (a,h) ANTHRACENE	6.79E-01	2.10E+00	7.30E+00	NA	1	1	0.1	0.1
DIBENZOFURAN	4.54E-01	1.20E+00	NA	NA	1	1	0.1	0.1
DI-n-BUTYL PHTHALATE	2.34E-01	3.20E-01	NA	1.00E-01	1	1	0.1	0.1
FLUORANTHENE	6.36E+00	2.50E+01	NA	4.00E-02	1	1	0.1	0.1
FLUORENE	3.19E-01	6.60E-01	NA	4.00E-02	1	1	0.1	0.1
INDENO (1,2,3-cd) PYRENE	1.33E+00	4.70E+00	7.30E-01	NA	1	1	0.1	0.1
2-METHYLNAPHTHALENE	1.03E+00	3.50E+00	NA	NA	1	1	0.1	0.1
NAPHTHALENE	8.29E-01	2.70E+00	NA	NA	1	1	0.1	0.1
PHENANTHRENE	3.40E+00	1.30E+01	NA	NA	1	1	0.1	0.1
PYRENE	4.60E+00	1.80E+01	NA	3.00E-02	1	1	0.1	0.1
METALS								
ALUMINUM	1.38E+04	1.81E+04	NA	NA	1	1	0.01	0.01
ARSENIC	1.58E+01	4.28E+01	1.75E+00	3.00E-04	1	1	0.01	0.01
BARIUM	2.16E+02	4.03E+02	NA	7.00E-02	1	1	0.01	0.01
BERYLLIUM	4.48E-01	7.17E-01	4.30E+00	5.00E-03	1	1	0.01	0.01
CADMIUM	2.14E+00	4.46E+00	NA	5.00E-04	1	1	0.01	0.01
CALCIUM	3.76E+04	6.21E+04	NA	NA	1	1	0.01	0.01
CHROMIUM	2.97E+01	5.09E+01	NA	NA	1	1	0.01	0.01
COBALT	9.86E+00	1.31E+01	NA	NA	1	1	0.01	0.01
COPPER	4.84E+01	1.16E+02	NA	3.70E-02	1	1	0.01	0.01
IRON	2.20E+04	2.88E+04	NA	NA	1	1	0.01	0.01
MAGNESIUM	1.41E+04	2.09E+04	NA	NA	1	1	0.01	0.01
MANGANESE	5.23E+02	7.37E+02	NA	5.00E-03	1	1	0.01	0.01
MERCURY	1.94E-01	4.69E-01	NA	NA	1	1	0.01	0.01
NICKEL	3.10E+01	5.33E+01	NA	2.00E-02	1	1	0.01	0.01
POTASSIUM	2.03E+03	2.59E+03	NA	NA	1	1	0.01	0.01
SELENIUM	3.40E-01	8.19E-01	NA	5.00E-03	1	1	0.01	0.01
SODIUM	1.56E+02	2.53E+02	NA	NA	1	1	0.01	0.01
THALLIUM	2.57E-01	3.83E-01	NA	7.00E-05	1	1	0.01	0.01
VANADIUM	3.01E+01	4.29E+01	NA	7.00E-03	1	1	0.01	0.01
ZINC	2.55E+02	6.16E+02	NA	3.00E-01	1	1	0.01	0.01

TABLE : 7

EXPOSURE, RISK AND HAZARD CALCULATIONS

EXPOSURE SCENARIO : TRESPASSER-CHILD
SITE : LEICA SITE
SECTOR : SECTOR A SOIL
LOCATION : ON-SITE

PARAMETER	LIFETIME AVERAGE DAILY INTAKE (mg/kg/day)		LIFETIME UPPER BOUND EXCESS CANCER RISK		ANNUAL AVERAGE DAILY INTAKE (mg/kg/day)		HAZARD QUOTIENT CDI/RfD	
	MEAN	RME	MEAN	RME	MEAN	RME	MEAN	RME
VOCs								
ACETONE	8.38E-10	3.66E-09	0.00E+00	0.00E+00	1.17E-08	5.13E-08	1.17E-07	5.13E-07
BROMOMETHANE	3.86E-10	4.40E-10	0.00E+00	0.00E+00	5.41E-09	6.16E-09	3.86E-06	4.40E-06
2-BUTANONE	4.37E-10	1.32E-09	0.00E+00	0.00E+00	6.12E-09	1.85E-08	1.02E-08	3.08E-08
CARBON DISULFIDE	3.75E-10	2.93E-10	0.00E+00	0.00E+00	5.25E-09	4.10E-09	5.25E-08	4.10E-08
1,,2-DICHLOROETHENE (TOTAL)	2.43E-09	1.16E-08	0.00E+00	0.00E+00	3.41E-08	1.62E-07	3.79E-06	1.80E-05
ETHYLBENZENE	6.22E-10	2.57E-09	0.00E+00	0.00E+00	8.71E-09	3.59E-08	8.71E-08	3.59E-07
2-HEXANONE	4.20E-10	8.80E-10	0.00E+00	0.00E+00	5.88E-09	1.23E-08	0.00E+00	0.00E+00
METHYLENE CHLORIDE	3.84E-10	2.93E-10	2.88E-12	2.20E-12	5.37E-09	4.10E-09	8.96E-08	6.84E-08
TOLUENE	5.77E-10	2.39E-09	0.00E+00	0.00E+00	8.08E-09	3.35E-08	4.04E-08	1.67E-07
TRICHLOROETHENE	1.18E-09	7.08E-09	0.00E+00	0.00E+00	1.66E-08	9.91E-08	0.00E+00	0.00E+00
VINYL CHLORIDE	6.22E-10	2.57E-09	1.18E-09	4.87E-09	8.71E-09	3.59E-08	0.00E+00	0.00E+00
XYLENES (TOTAL)	1.45E-09	8.90E-09	0.00E+00	0.00E+00	2.03E-08	1.25E-07	1.01E-08	6.23E-08
SVOCs								
ACENAPHTHENE	1.76E-08	7.23E-08	0.00E+00	0.00E+00	2.46E-07	1.01E-06	4.11E-06	1.69E-05
ACENAPHTHYLENE	1.41E-08	4.26E-08	0.00E+00	0.00E+00	1.98E-07	5.96E-07	0.00E+00	0.00E+00
ANTHRACENE	3.17E-08	1.94E-07	0.00E+00	0.00E+00	4.43E-07	2.71E-06	1.48E-06	9.04E-06
BENZO (a) ANTHRACENE	1.35E-07	1.08E-06	9.83E-08	7.92E-07	1.89E-06	1.52E-05	0.00E+00	0.00E+00
BENZO (b) FLUORANTHENE	3.68E-07	3.10E-06	2.69E-07	2.26E-06	5.16E-06	4.34E-05	0.00E+00	0.00E+00
BENZO (k) FLUORANTHENE	1.74E-07	1.42E-06	1.27E-08	1.04E-07	2.43E-06	1.99E-05	0.00E+00	0.00E+00
BENZO (g,h,i) PERYLENE	7.48E-08	5.68E-07	0.00E+00	0.00E+00	1.05E-06	7.95E-06	0.00E+00	0.00E+00
BENZO (a) PYRENE	1.89E-07	1.55E-06	1.38E-06	1.13E-05	2.64E-06	2.17E-05	0.00E+00	0.00E+00
BIS (2-ETHYLHEXYL) PHTHALATE	1.28E-07	9.94E-07	1.79E-09	1.39E-08	1.79E-06	1.39E-05	8.93E-05	6.96E-04
BUTYL BENZYL PHTHALATE	1.82E-08	7.75E-08	0.00E+00	0.00E+00	2.55E-07	1.08E-06	1.27E-06	5.42E-06
CARBAZOLE	8.68E-08	6.71E-07	1.74E-09	1.34E-08	1.22E-06	9.40E-06	0.00E+00	0.00E+00
CHRYSENE	1.31E-07	1.05E-06	9.53E-10	7.63E-09	1.83E-06	1.46E-05	0.00E+00	0.00E+00
DIBENZO (a,h) ANTHRACENE	4.07E-08	2.71E-07	2.97E-07	1.98E-06	5.69E-07	3.80E-06	0.00E+00	0.00E+00
DIBENZOFURAN	2.72E-08	1.55E-07	0.00E+00	0.00E+00	3.81E-07	2.17E-06	0.00E+00	0.00E+00
DI-n-BUTYL PHTHALATE	1.40E-08	4.13E-08	0.00E+00	0.00E+00	1.96E-07	5.78E-07	1.96E-06	5.78E-06
FLUORANTHENE	3.81E-07	3.23E-06	0.00E+00	0.00E+00	5.33E-06	4.52E-05	1.33E-04	1.13E-03
FLUORENE	1.91E-08	8.52E-08	0.00E+00	0.00E+00	2.67E-07	1.19E-06	6.69E-06	2.98E-05
INDENO (1,2,3-cd) PYRENE	7.96E-08	6.07E-07	5.81E-08	4.43E-07	1.11E-06	8.49E-06	0.00E+00	0.00E+00
2-METHYLNAPHTHALENE	6.17E-08	4.52E-07	0.00E+00	0.00E+00	8.63E-07	6.33E-06	0.00E+00	0.00E+00
NAPHTHALENE	4.96E-08	3.49E-07	0.00E+00	0.00E+00	6.95E-07	4.88E-06	0.00E+00	0.00E+00
PHENANTHRENE	2.04E-07	1.68E-06	0.00E+00	0.00E+00	2.85E-06	2.35E-05	0.00E+00	0.00E+00
PYRENE	2.75E-07	2.32E-06	0.00E+00	0.00E+00	3.86E-06	3.25E-05	1.29E-04	1.08E-03
METALS								
ALUMINUM	8.12E-04	2.15E-03	0.00E+00	0.00E+00	1.14E-02	3.00E-02	0.00E+00	0.00E+00
ARSENIC	9.29E-07	5.08E-06	1.63E-06	8.88E-06	1.30E-05	7.11E-05	4.34E-02	2.37E-01
BARIUM	1.27E-05	4.78E-05	0.00E+00	0.00E+00	1.78E-04	6.69E-04	2.54E-03	9.56E-03
BERYLLIUM	2.64E-08	8.50E-08	1.13E-07	3.66E-07	3.69E-07	1.19E-06	7.38E-05	2.38E-04
CADMIUM	1.26E-07	5.29E-07	0.00E+00	0.00E+00	1.76E-06	7.40E-06	3.52E-03	1.48E-02
CALCIUM	2.21E-03	7.36E-03	0.00E+00	0.00E+00	3.10E-02	1.03E-01	0.00E+00	0.00E+00
CHROMIUM	1.75E-06	6.04E-06	0.00E+00	0.00E+00	2.45E-05	8.45E-05	0.00E+00	0.00E+00
COBALT	5.80E-07	1.55E-06	0.00E+00	0.00E+00	8.12E-06	2.17E-05	0.00E+00	0.00E+00
COPPER	2.85E-06	1.38E-05	0.00E+00	0.00E+00	3.99E-05	1.93E-04	1.08E-03	5.20E-03
IRON	1.29E-03	3.42E-03	0.00E+00	0.00E+00	1.81E-02	4.78E-02	0.00E+00	0.00E+00
MAGNESIUM	8.29E-04	2.48E-03	0.00E+00	0.00E+00	1.16E-02	3.47E-02	0.00E+00	0.00E+00
MANGANESE	3.08E-05	8.74E-05	0.00E+00	0.00E+00	4.31E-04	1.22E-03	8.61E-02	2.45E-01
MERCURY	1.14E-08	5.56E-08	0.00E+00	0.00E+00	1.60E-07	7.79E-07	0.00E+00	0.00E+00
NICKEL	1.82E-06	6.32E-06	0.00E+00	0.00E+00	2.55E-05	8.85E-05	1.28E-03	4.42E-03
POTASSIUM	1.19E-04	3.07E-04	0.00E+00	0.00E+00	1.67E-03	4.30E-03	0.00E+00	0.00E+00
SELENIUM	2.00E-08	9.71E-08	0.00E+00	0.00E+00	2.80E-07	1.36E-06	5.60E-05	2.72E-04
SODIUM	9.18E-06	3.00E-05	0.00E+00	0.00E+00	1.28E-04	4.20E-04	0.00E+00	0.00E+00
THALLIUM	1.51E-08	4.54E-08	0.00E+00	0.00E+00	2.12E-07	6.36E-07	3.02E-03	9.08E-03
VANADIUM	1.77E-06	5.09E-06	0.00E+00	0.00E+00	2.48E-05	7.12E-05	3.54E-03	1.02E-02
ZINC	1.50E-05	7.30E-05	0.00E+00	0.00E+00	2.10E-04	1.02E-03	7.00E-04	3.41E-03
	TOTAL ADDITIONAL ESTIMATED CANCER RISKS :						**HAZARD INDEX :**	
			3.86E-06	2.62E-05			1.46E-01	5.42E-01

TABLE : 8

SUMMARY TABLE

EXPOSURE SCENARIO : TRESPASSER-CHILD
SITE : LEICA SITE
SECTOR : SECTOR A SOIL
LOCATION : ON-SITE

PARAMETER	MEDIA CONCENTRATION		LIFETIME UPPER BOUND EXCESS CANCER RISK		HAZARD QUOTIENT CDI/RfD	
	MEAN mg/kg	RME mg/kg	MEAN	RME	MEAN	RME
VOCs						
ACETONE	1.36E-02	2.50E-02	0.00E+00	0.00E+00	1.17E-07	5.13E-07
BROMOMETHANE	6.27E-03	3.00E-03	0.00E+00	0.00E+00	3.86E-06	4.40E-06
2-BUTANONE	7.09E-03	9.00E-03	0.00E+00	0.00E+00	1.02E-08	3.08E-08
CARBON DISULFIDE	6.09E-03	2.00E-03	0.00E+00	0.00E+00	5.25E-08	4.10E-08
1,2-DICHLOROETHENE (TOTAL)	3.95E-02	7.91E-02	0.00E+00	0.00E+00	3.79E-06	1.80E-05
ETHYLBENZENE	1.01E-02	1.75E-02	0.00E+00	0.00E+00	8.71E-08	3.59E-07
2-HEXANONE	6.82E-03	6.00E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00
METHYLENE CHLORIDE	6.23E-03	2.00E-03	2.88E-12	2.20E-12	8.96E-08	6.84E-08
TOLUENE	9.36E-03	1.63E-02	0.00E+00	0.00E+00	4.04E-08	1.67E-07
TRICHLOROETHENE	1.92E-02	4.83E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00
VINYL CHLORIDE	1.01E-02	1.75E-02	1.18E-09	4.87E-09	0.00E+00	0.00E+00
XYLENES (TOTAL)	2.35E-02	6.07E-02	0.00E+00	0.00E+00	1.01E-08	6.23E-08
SVOCs						
ACENAPHTHENE	2.94E-01	5.60E-01	0.00E+00	0.00E+00	4.11E-06	1.69E-05
ACENAPHTHYLENE	2.36E-01	3.30E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ANTHRACENE	5.29E-01	1.50E+00	0.00E+00	0.00E+00	1.48E-06	9.04E-06
BENZO (a) ANTHRACENE	2.25E+00	8.40E+00	9.83E-08	7.92E-07	0.00E+00	0.00E+00
BENZO (b) FLUORANTHENE	6.15E+00	2.40E+01	2.69E-07	2.26E-06	0.00E+00	0.00E+00
BENZO (k) FLUORANTHENE	2.90E+00	1.10E+01	1.27E-08	1.04E-07	0.00E+00	0.00E+00
BENZO (g,h,i) PERYLENE	1.25E+00	4.40E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BENZO (a) PYRENE	3.15E+00	1.20E+01	1.38E-06	1.13E-05	0.00E+00	0.00E+00
BIS (2-ETHYLHEXYL) PHTHALATE	2.13E+00	7.70E+00	1.79E-09	1.39E-08	8.93E-05	6.96E-04
BUTYL BENZYL PHTHALATE	3.04E-01	6.00E-01	0.00E+00	0.00E+00	1.27E-06	5.42E-06
CARBAZOLE	1.45E+00	5.20E+00	1.74E-09	1.34E-08	0.00E+00	0.00E+00
CHRYSENE	2.18E+00	8.10E+00	9.53E-10	7.63E-09	0.00E+00	0.00E+00
DIBENZO (a,h) ANTHRACENE	6.79E-01	2.10E+00	2.97E-07	1.98E-06	0.00E+00	0.00E+00
DIBENZOFURAN	4.54E-01	1.20E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
DI-n-BUTYL PHTHALATE	2.34E-01	3.20E-01	0.00E+00	0.00E+00	1.96E-06	5.78E-06
FLUORANTHENE	6.36E+00	2.50E+01	0.00E+00	0.00E+00	1.33E-04	1.13E-03
FLUORENE	3.19E-01	6.60E-01	0.00E+00	0.00E+00	6.69E-06	2.98E-05
INDENO (1,2,3-cd) PYRENE	1.33E+00	4.70E+00	5.81E-08	4.43E-07	0.00E+00	0.00E+00
2-METHYLNAPHTHALENE	1.03E+00	3.50E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NAPHTHALENE	8.29E-01	2.70E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PHENANTHRENE	3.40E+00	1.30E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PYRENE	4.60E+00	1.80E+01	0.00E+00	0.00E+00	1.29E-04	1.08E-03
METALS						
ALUMINUM	1.38E+04	1.81E+04	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ARSENIC	1.58E+01	4.28E+01	1.63E-06	8.88E-06	4.34E-02	2.37E-01
BARIUM	2.16E+02	4.03E+02	0.00E+00	0.00E+00	2.54E-03	9.56E-03
BERYLLIUM	4.48E-01	7.17E-01	1.13E-07	3.66E-07	7.38E-05	2.38E-04
CADMIUM	2.14E+00	4.46E+00	0.00E+00	0.00E+00	3.52E-03	1.48E-02
CALCIUM	3.76E+04	6.21E+04	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHROMIUM	2.97E+01	5.09E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00
COBALT	9.86E+00	1.31E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00
COPPER	4.84E+01	1.16E+02	0.00E+00	0.00E+00	1.08E-03	5.20E-03
IRON	2.20E+04	2.88E+04	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MAGNESIUM	1.41E+04	2.09E+04	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MANGANESE	5.23E+02	7.37E+02	0.00E+00	0.00E+00	8.61E-02	2.45E-01
MERCURY	1.94E-01	4.69E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NICKEL	3.10E+01	5.33E+01	0.00E+00	0.00E+00	1.28E-03	4.42E-03
POTASSIUM	2.03E+03	2.59E+03	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SELENIUM	3.40E-01	8.19E-01	0.00E+00	0.00E+00	5.60E-05	2.72E-04
SODIUM	1.56E+02	2.53E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00
THALLIUM	2.57E-01	3.83E-01	0.00E+00	0.00E+00	3.02E-03	9.08E-03
VANADIUM	3.01E+01	4.29E+01	0.00E+00	0.00E+00	3.54E-03	1.02E-02
ZINC	2.55E+02	6.16E+02	0.00E+00	0.00E+00	7.00E-04	3.41E-03
	TOTAL ADDITIONAL ESTIMATED CANCER RISK				**HAZARD INDEX :**	
			3.86E-06	2.62E-05	1.46E-01	5.42E-01

TABLE : 9

EXPOSURE SCENARIO FORMULA AND ASSUMPTIONS

EXPOSURE SCENARIO : TRESPASSER
SITE : LEICA SITE
SECTOR : SECTOR A SOIL
LOCATION : ON-SITE

EQUATION : $\text{INTAKE (mg/kg-day)} = \frac{CS \times CF \times SA \times AF \times MF \times ABS \times EF \times ED}{AT \times BW} + \frac{CS \times IR \times ABS \times CF \times EF \times ED}{AT \times BW} \times PTF$

where :
CS = Chemical Concentration in Soil (mg/kg)
IR = Ingestion Rate (mg soil/day)
SA = Skin Surface Area Available for Contact (cm2/event)
CF = Conversion Factor (10E-06 kg/mg)
EF = Exposure Frequency (days/years)
ED = Exposure Duration (years)
BW = Body Weight (kg)
AT = Averaging Time (period over which exposure is averaged -- days)
AF = Soil to Skin Adherence Factor (mg/cm2)
ABS = Absorption Factor (unitless)
MF = Matrix Factor; part of chemical on soil that is in contact with skin (%/100)
PTF = Percent of Time Factor: Percent of time in contaminated area. (%/100)

VARIABLE	MEAN	RME	REFERENCES
CS (mg/kg)	MEAN	95% UCL	RAGS (1,2)
IR - OLDER CHILD (mg/exposure)	100	100	RAGS (1,2)
SA - OLDER CHILD (cm2)	5300	5300	DEAP (3)
CF (kg/mg)	0.000001	0.000001	RAGS (1,2)
EF (days/year)	24	48	PROFESSIONAL JUDGEMENT
ED - OLDER CHILD (CARCINOGEN) (yrs)	12	12	RAGS (1,2)
ED (NON-CARCINOGEN) (yrs)	1	1	RAGS (1,2)
BW - OLDER CHILD (kg)	45	45	RAGS (1,2)
AT (CARCINOGEN) (yrs x days /yr)	25550	25550	RAGS (1,2)
AT (NON - CARCINOGEN) (yrs x days /yr)	365	365	RAGS (1,2)
AF (mg/cm2)	0.2	1	DEAP (3)
MF	0.15	0.15	HAWLEY (4)
ABS ORAL (CHEMICAL SPECIFIC)			
DERMAL (CHEMICAL SPECIFIC)			
PTF	1	1	PROFESSIONAL JUDGEMENT

NOTE :
(1) EPA "RISK ASSESSMENT GUIDANCE FOR SUPERFUND MANUAL, DECEMBER 1989, EPA/540/1-89/002.
(2) SUPPLEMENTAL GUIDANCE: "STANDARD DEFAULT EXPOSRE FACTORS", OSWER DIRECTIVE: 9285.6-03, MARCH 25, 1991.
(3) EPA DERMAL EXPOSURE ASSESSMENT: PRINCIPLES AND APPLICATIONS, EPA/600/8-89/011B, JANUARY 1992.
(4) HAWLEY, J.K., "ASSESSMENT OF HEALTH RISK FROM EXPOSURE TO CONTAMINATED SOIL", RISK ANALYSIS, VOL.5 NO.4, 1985.

TABLE : 10

MEDIA CONCENTRATIONS/CONSTANTS

EXPOSURE SCENARIO : TRESPASSER-OLDER CHILD
SITE : LEICA SITE
SECTOR : SECTOR A SOIL
LOCATION : ON-SITE

	MEDIA CONCENTRATION				ORAL BIOAVAIL. FACTOR		DERMAL BIOAVAIL. FACTOR	
PARAMETER	MEAN mg/kg	RME mg/kg	ORAL CSF 1/(mg/kg/d)	ORAL RfD mg/kg/d	MEAN %/100	RME %/100	MEAN %/100	RME %/100
VOCs								
ACETONE	1.36E-02	2.50E-02	NA	1.00E-01	1	1	0.25	0.25
BROMOMETHANE	6.27E-03	3.00E-03	NA	1.40E-03	1	1	0.25	0.25
2-BUTANONE	7.09E-03	9.00E-03	NA	6.00E-01	1	1	0.25	0.25
CARBON DISULFIDE	6.09E-03	2.00E-03	NA	1.00E-01	1	1	0.25	0.25
1,2-DICHLOROETHENE (TOTAL)	3.95E-02	7.91E-02	NA	9.00E-03	1	1	0.25	0.25
ETHYLBENZENE	1.01E-02	1.75E-02	NA	1.00E-01	1	1	0.25	0.25
2-HEXANONE	6.82E-03	6.00E-03	NA	NA	1	1	0.25	0.25
METHYLENE CHLORIDE	6.23E-03	2.00E-03	7.50E-03	6.00E-02	1	1	0.25	0.25
TOLUENE	9.36E-03	1.63E-02	NA	2.00E-01	1	1	0.25	0.25
TRICHLOROETHENE	1.92E-02	4.83E-02	NA	NA	1	1	0.25	0.25
VINYL CHLORIDE	1.01E-02	1.75E-02	1.90E+00	NA	1	1	0.25	0.25
XYLENES (TOTAL)	2.35E-02	6.07E-02	NA	2.00E+00	1	1	0.25	0.25
SVOCs								
ACENAPHTHENE	2.94E-01	5.60E-01	NA	6.00E-02	1	1	0.1	0.1
ACENAPHTHYLENE	2.36E-01	3.30E-01	NA	NA	1	1	0.1	0.1
ANTHRACENE	5.29E-01	1.50E+00	NA	3.00E-01	1	1	0.1	0.1
BENZO (a) ANTHRACENE	2.25E+00	8.40E+00	7.30E-01	NA	1	1	0.1	0.1
BENZO (b) FLUORANTHENE	6.15E+00	2.40E+01	7.30E-01	NA	1	1	0.1	0.1
BENZO (k) FLUORANTHENE	2.90E+00	1.10E+01	7.30E-02	NA	1	1	0.1	0.1
BENZO (g,h,i) PERYLENE	1.25E+00	4.40E+00	NA	NA	1	1	0.1	0.1
BENZO (a) PYRENE	3.15E+00	1.20E+01	7.30E+00	NA	1	1	0.1	0.1
BIS (2-ETHYLHEXYL) PHTHALATE	2.13E+00	7.70E+00	1.40E-02	2.00E-02	1	1	0.1	0.1
BUTYL BENZYL PHTHALATE	3.04E-01	6.00E-01	NA	2.00E-01	1	1	0.1	0.1
CARBAZOLE	1.45E+00	5.20E+00	2.00E-02	NA	1	1	0.1	0.1
CHRYSENE	2.18E+00	8.10E+00	7.30E-03	NA	1	1	0.1	0.1
DIBENZO (a,h) ANTHRACENE	6.79E-01	2.10E+00	7.30E+00	NA	1	1	0.1	0.1
DIBENZOFURAN	4.54E-01	1.20E+00	NA	NA	1	1	0.1	0.1
DI-n-BUTYL PHTHALATE	2.34E-01	3.20E-01	NA	1.00E-01	1	1	0.1	0.1
FLUORANTHENE	6.36E+00	2.50E+01	NA	4.00E-02	1	1	0.1	0.1
FLUORENE	3.19E-01	6.60E-01	NA	4.00E-02	1	1	0.1	0.1
INDENO (1,2,3-cd) PYRENE	1.33E+00	4.70E+00	7.30E-01	NA	1	1	0.1	0.1
2-METHYLNAPHTHALENE	1.03E+00	3.50E+00	NA	NA	1	1	0.1	0.1
NAPHTHALENE	8.29E-01	2.70E+00	NA	NA	1	1	0.1	0.1
PHENANTHRENE	3.40E+00	1.30E+01	NA	NA	1	1	0.1	0.1
PYRENE	4.60E+00	1.80E+01	NA	3.00E-02	1	1	0.1	0.1
METALS								
ALUMINUM	1.38E+04	1.81E+04	NA	NA	1	1	0.01	0.01
ARSENIC	1.58E+01	4.28E+01	1.75E+00	3.00E-04	1	1	0.01	0.01
BARIUM	2.16E+02	4.03E+02	NA	7.00E-02	1	1	0.01	0.01
BERYLLIUM	4.48E-01	7.17E-01	4.30E+00	5.00E-03	1	1	0.01	0.01
CADMIUM	2.14E+00	4.46E+00	NA	5.00E-04	1	1	0.01	0.01
CALCIUM	3.76E+04	6.21E+04	NA	NA	1	1	0.01	0.01
CHROMIUM	2.97E+01	5.09E+01	NA	NA	1	1	0.01	0.01
COBALT	9.86E+00	1.31E+01	NA	NA	1	1	0.01	0.01
COPPER	4.84E+01	1.16E+02	NA	3.70E-02	1	1	0.01	0.01
IRON	2.20E+04	2.88E+04	NA	NA	1	1	0.01	0.01
MAGNESIUM	1.41E+04	2.09E+04	NA	NA	1	1	0.01	0.01
MANGANESE	5.23E+02	7.37E+02	NA	5.00E-03	1	1	0.01	0.01
MERCURY	1.94E-01	4.69E-01	NA	NA	1	1	0.01	0.01
NICKEL	3.10E+01	5.33E+01	NA	2.00E-02	1	1	0.01	0.01
POTASSIUM	2.03E+03	2.59E+03	NA	NA	1	1	0.01	0.01
SELENIUM	3.40E-01	8.19E-01	NA	5.00E-03	1	1	0.01	0.01
SODIUM	1.56E+02	2.53E+02	NA	NA	1	1	0.01	0.01
THALLIUM	2.57E-01	3.83E-01	NA	7.00E-05	1	1	0.01	0.01
VANADIUM	3.01E+01	4.29E+01	NA	7.00E-03	1	1	0.01	0.01
ZINC	2.55E+02	6.16E+02	NA	3.00E-01	1	1	0.01	0.01

TABLE : 11

EXPOSURE, RISK AND HAZARD CALCULATIONS

EXPOSURE SCENARIO : TRESPASSER-OLDER CHILD
SITE : LEICA SITE
SECTOR : SECTOR A SOIL
LOCATION : ON-SITE

	LIFETIME AVERAGE DAILY INTAKE (mg/kg/day)		LIFETIME UPPER BOUND EXCESS CANCER RISK		ANNUAL AVERAGE DAILY INTAKE (mg/kg/day)		HAZARD QUOTIENT CDI/RfD	
PARAMETER	MEAN	RME	MEAN	RME	MEAN	RME	MEAN	RME
VOCs								
ACETONE	4.76E-10	3.74E-09	0.00E+00	0.00E+00	2.78E-09	2.18E-08	2.78E-08	2.18E-07
BROMOMETHANE	2.19E-10	4.49E-10	0.00E+00	0.00E+00	1.28E-09	2.62E-09	9.15E-07	1.87E-06
2-BUTANONE	2.48E-10	1.35E-09	0.00E+00	0.00E+00	1.45E-09	7.86E-09	2.41E-09	1.31E-08
CARBON DISULFIDE	2.13E-10	2.99E-10	0.00E+00	0.00E+00	1.24E-09	1.75E-09	1.24E-08	1.75E-08
1,,2-DICHLOROETHENE (TOTAL)	1.38E-09	1.18E-08	0.00E+00	0.00E+00	8.07E-09	6.91E-08	8.96E-07	7.67E-06
ETHYLBENZENE	3.54E-10	2.62E-09	0.00E+00	0.00E+00	2.06E-09	1.53E-08	2.06E-08	1.53E-07
2-HEXANONE	2.39E-10	8.98E-10	0.00E+00	0.00E+00	1.39E-09	5.24E-09	0.00E+00	0.00E+00
METHYLENE CHLORIDE	2.18E-10	2.99E-10	1.64E-12	2.25E-12	1.27E-09	1.75E-09	2.12E-08	2.91E-08
TOLUENE	3.28E-10	2.44E-09	0.00E+00	0.00E+00	1.91E-09	1.42E-08	9.56E-09	7.12E-08
TRICHLOROETHENE	6.72E-10	7.23E-09	0.00E+00	0.00E+00	3.92E-09	4.22E-08	0.00E+00	0.00E+00
VINYL CHLORIDE	3.54E-10	2.62E-09	6.72E-10	4.98E-09	2.06E-09	1.53E-08	0.00E+00	0.00E+00
XYLENES (TOTAL)	8.23E-10	9.08E-09	0.00E+00	0.00E+00	4.80E-09	5.30E-08	2.40E-09	2.65E-08
SVOCs								
ACENAPHTHENE	8.54E-09	5.04E-08	0.00E+00	0.00E+00	4.98E-08	2.94E-07	8.30E-07	4.90E-06
ACENAPHTHYLENE	6.85E-09	2.97E-08	0.00E+00	0.00E+00	4.00E-08	1.73E-07	0.00E+00	0.00E+00
ANTHRACENE	1.54E-08	1.35E-07	0.00E+00	0.00E+00	8.96E-08	7.87E-07	2.99E-07	2.62E-06
BENZO (a) ANTHRACENE	6.53E-08	7.55E-07	4.77E-08	5.51E-07	3.81E-07	4.41E-06	0.00E+00	0.00E+00
BENZO (b) FLUORANTHENE	1.79E-07	2.16E-06	1.30E-07	1.58E-06	1.04E-06	1.26E-05	0.00E+00	0.00E+00
BENZO (k) FLUORANTHENE	8.42E-08	9.89E-07	6.15E-09	7.22E-08	4.91E-07	5.77E-06	0.00E+00	0.00E+00
BENZO (g,h,i) PERYLENE	3.63E-08	3.96E-07	0.00E+00	0.00E+00	2.12E-07	2.31E-06	0.00E+00	0.00E+00
BENZO (a) PYRENE	9.14E-08	1.08E-06	6.68E-07	7.88E-06	5.33E-07	6.29E-06	0.00E+00	0.00E+00
BIS (2-ETHYLHEXYL) PHTHALATE	6.18E-08	6.92E-07	8.66E-10	9.69E-09	3.61E-07	4.04E-06	1.80E-05	2.02E-04
UTYL BENZYL PHTHALATE	8.83E-09	5.40E-08	0.00E+00	0.00E+00	5.15E-08	3.15E-07	2.57E-07	1.57E-06
CARBAZOLE	4.21E-08	4.68E-07	8.42E-10	9.35E-09	2.46E-07	2.73E-06	0.00E+00	0.00E+00
CHRYSENE	6.33E-08	7.28E-07	4.62E-10	5.32E-09	3.69E-07	4.25E-06	0.00E+00	0.00E+00
DIBENZO (a,h) ANTHRACENE	1.97E-08	1.89E-07	1.44E-07	1.38E-06	1.15E-07	1.10E-06	0.00E+00	0.00E+00
DIBENZOFURAN	1.32E-08	1.08E-07	0.00E+00	0.00E+00	7.69E-08	6.29E-07	0.00E+00	0.00E+00
DI-n-BUTYL PHTHALATE	6.79E-09	2.88E-08	0.00E+00	0.00E+00	3.96E-08	1.68E-07	3.96E-07	1.68E-06
FLUORANTHENE	1.85E-07	2.25E-06	0.00E+00	0.00E+00	1.08E-06	1.31E-05	2.69E-05	3.28E-04
FLUORENE	9.26E-09	5.94E-08	0.00E+00	0.00E+00	5.40E-08	3.46E-07	1.35E-06	8.66E-06
INDENO (1,2,3-cd) PYRENE	3.86E-08	4.23E-07	2.82E-08	3.09E-07	2.25E-07	2.47E-06	0.00E+00	0.00E+00
2-METHYLNAPHTHALENE	2.99E-08	3.15E-07	0.00E+00	0.00E+00	1.74E-07	1.84E-06	0.00E+00	0.00E+00
NAPHTHALENE	2.41E-08	2.43E-07	0.00E+00	0.00E+00	1.40E-07	1.42E-06	0.00E+00	0.00E+00
PHENANTHRENE	9.87E-08	1.17E-06	0.00E+00	0.00E+00	5.76E-07	6.82E-06	0.00E+00	0.00E+00
PYRENE	1.34E-07	1.62E-06	0.00E+00	0.00E+00	7.79E-07	9.44E-06	2.60E-05	3.15E-04
METALS								
ALUMINUM	3.51E-04	9.79E-04	0.00E+00	0.00E+00	2.05E-03	5.71E-03	0.00E+00	0.00E+00
ARSENIC	4.02E-07	2.31E-06	7.04E-07	4.05E-06	2.35E-06	1.35E-05	7.82E-03	4.50E-02
BARIUM	5.50E-06	2.18E-05	0.00E+00	0.00E+00	3.21E-05	1.27E-04	4.58E-04	1.82E-03
BERYLLIUM	1.14E-08	3.88E-08	4.90E-08	1.67E-07	6.65E-08	2.26E-07	1.33E-05	4.52E-05
CADMIUM	5.45E-08	2.41E-07	0.00E+00	0.00E+00	3.18E-07	1.41E-06	6.35E-04	2.81E-03
CALCIUM	9.57E-04	3.36E-03	0.00E+00	0.00E+00	5.58E-03	1.96E-02	0.00E+00	0.00E+00
CHROMIUM	7.56E-07	2.75E-06	0.00E+00	0.00E+00	4.41E-06	1.61E-05	0.00E+00	0.00E+00
COBALT	2.51E-07	7.08E-07	0.00E+00	0.00E+00	1.46E-06	4.13E-06	0.00E+00	0.00E+00
COPPER	1.23E-06	6.27E-06	0.00E+00	0.00E+00	7.18E-06	3.66E-05	1.94E-04	9.89E-04
IRON	5.60E-04	1.56E-03	0.00E+00	0.00E+00	3.27E-03	9.09E-03	0.00E+00	0.00E+00
MAGNESIUM	3.59E-04	1.13E-03	0.00E+00	0.00E+00	2.09E-03	6.59E-03	0.00E+00	0.00E+00
MANGANESE	1.33E-05	3.99E-05	0.00E+00	0.00E+00	7.76E-05	2.33E-04	1.55E-02	4.65E-02
MERCURY	4.94E-09	2.54E-08	0.00E+00	0.00E+00	2.88E-08	1.48E-07	0.00E+00	0.00E+00
NICKEL	7.89E-07	2.88E-06	0.00E+00	0.00E+00	4.60E-06	1.68E-05	2.30E-04	8.41E-04
POTASSIUM	5.17E-05	1.40E-04	0.00E+00	0.00E+00	3.01E-04	8.17E-04	0.00E+00	0.00E+00
SELENIUM	8.65E-09	4.43E-08	0.00E+00	0.00E+00	5.05E-08	2.58E-07	1.01E-05	5.17E-05
SODIUM	3.97E-06	1.37E-05	0.00E+00	0.00E+00	2.32E-05	7.98E-05	0.00E+00	0.00E+00
THALLIUM	6.54E-09	2.07E-08	0.00E+00	0.00E+00	3.81E-08	1.21E-07	5.45E-04	1.73E-03
VANADIUM	7.66E-07	2.32E-06	0.00E+00	0.00E+00	4.47E-06	1.35E-05	6.38E-04	1.93E-03
ZINC	6.49E-06	3.33E-05	0.00E+00	0.00E+00	3.79E-05	1.94E-04	1.26E-04	6.48E-04
	TOTAL ADDITIONAL ESTIMATED CANCER RISKS :						HAZARD INDEX :	
			1.78E-06	1.60E-05			2.63E-02	1.03E-01

TABLE : 12

SUMMARY TABLE

EXPOSURE SCENARIO : TRESPASSER-OLDER CHILD
SITE : LEICA SITE
SECTOR : SECTOR A SOIL
LOCATION : ON-SITE

	MEDIA CONCENTRATION		LIFETIME UPPER BOUND EXCESS CANCER RISK		HAZARD QUOTIENT CDI/RfD	
PARAMETER	MEAN mg/kg	RME mg/kg	MEAN	RME	MEAN	RME
VOCs						
ACETONE	1.36E-02	2.50E-02	0.00E+00	0.00E+00	2.78E-08	2.18E-07
BROMOMETHANE	6.27E-03	3.00E-03	0.00E+00	0.00E+00	9.15E-07	1.87E-06
2-BUTANONE	7.09E-03	9.00E-03	0.00E+00	0.00E+00	2.41E-09	1.31E-08
CARBON DISULFIDE	6.09E-03	2.00E-03	0.00E+00	0.00E+00	1.24E-08	1.75E-08
1,2-DICHLOROETHENE (TOTAL)	3.95E-02	7.91E-02	0.00E+00	0.00E+00	8.96E-07	7.67E-06
ETHYLBENZENE	1.01E-02	1.75E-02	0.00E+00	0.00E+00	2.06E-08	1.53E-07
2-HEXANONE	6.82E-03	6.00E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00
METHYLENE CHLORIDE	6.23E-03	2.00E-03	1.64E-12	2.25E-12	2.12E-08	2.91E-08
TOLUENE	9.36E-03	1.63E-02	0.00E+00	0.00E+00	9.56E-09	7.12E-08
TRICHLOROETHENE	1.92E-02	4.83E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00
VINYL CHLORIDE	1.01E-02	1.75E-02	6.72E-10	4.98E-09	0.00E+00	0.00E+00
XYLENES (TOTAL)	2.35E-02	6.07E-02	0.00E+00	0.00E+00	2.40E-09	2.65E-08
SVOCs						
ACENAPHTHENE	2.94E-01	5.60E-01	0.00E+00	0.00E+00	8.30E-07	4.90E-06
ACENAPHTHYLENE	2.36E-01	3.30E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ANTHRACENE	5.29E-01	1.50E+00	0.00E+00	0.00E+00	2.99E-07	2.62E-06
BENZO (a) ANTHRACENE	2.25E+00	8.40E+00	4.77E-08	5.51E-07	0.00E+00	0.00E+00
BENZO (b) FLUORANTHENE	6.15E+00	2.40E+01	1.30E-07	1.58E-06	0.00E+00	0.00E+00
BENZO (k) FLUORANTHENE	2.90E+00	1.10E+01	6.15E-09	7.22E-08	0.00E+00	0.00E+00
BENZO (g,h,i) PERYLENE	1.25E+00	4.40E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BENZO (a) PYRENE	3.15E+00	1.20E+01	6.68E-07	7.88E-06	0.00E+00	0.00E+00
BIS (2-ETHYLHEXYL) PHTHALATE	2.13E+00	7.70E+00	8.66E-10	9.69E-09	1.80E-05	2.02E-04
BUTYL BENZYL PHTHALATE	3.04E-01	6.00E-01	0.00E+00	0.00E+00	2.57E-07	1.57E-06
CARBAZOLE	1.45E+00	5.20E+00	8.42E-10	9.35E-09	0.00E+00	0.00E+00
CHRYSENE	2.18E+00	8.10E+00	4.62E-10	5.32E-09	0.00E+00	0.00E+00
DIBENZO (a,h) ANTHRACENE	6.79E-01	2.10E+00	1.44E-07	1.38E-06	0.00E+00	0.00E+00
DIBENZOFURAN	4.54E-01	1.20E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
DI-n-BUTYL PHTHALATE	2.34E-01	3.20E-01	0.00E+00	0.00E+00	3.96E-07	1.68E-06
FLUORANTHENE	6.36E+00	2.50E+01	0.00E+00	0.00E+00	2.69E-05	3.28E-04
FLUORENE	3.19E-01	6.60E-01	0.00E+00	0.00E+00	1.35E-06	8.66E-06
INDENO (1,2,3-cd) PYRENE	1.33E+00	4.70E+00	2.82E-08	3.09E-07	0.00E+00	0.00E+00
2-METHYLNAPHTHALENE	1.03E+00	3.50E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NAPHTHALENE	8.29E-01	2.70E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PHENANTHRENE	3.40E+00	1.30E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PYRENE	4.60E+00	1.80E+01	0.00E+00	0.00E+00	2.60E-05	3.15E-04
METALS						
ALUMINUM	1.38E+04	1.81E+04	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ARSENIC	1.58E+01	4.28E+01	7.04E-07	4.05E-06	7.82E-03	4.50E-02
BARIUM	2.16E+02	4.03E+02	0.00E+00	0.00E+00	4.58E-04	1.82E-03
BERYLLIUM	4.48E-01	7.17E-01	4.90E-08	1.67E-07	1.33E-05	4.52E-05
CADMIUM	2.14E+00	4.46E+00	0.00E+00	0.00E+00	6.35E-04	2.81E-03
CALCIUM	3.76E+04	6.21E+04	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHROMIUM	2.97E+01	5.09E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00
COBALT	9.86E+00	1.31E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00
COPPER	4.84E+01	1.16E+02	0.00E+00	0.00E+00	1.94E-04	9.89E-04
IRON	2.20E+04	2.88E+04	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MAGNESIUM	1.41E+04	2.09E+04	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MANGANESE	5.23E+02	7.37E+02	0.00E+00	0.00E+00	1.55E-02	4.65E-02
MERCURY	1.94E-01	4.69E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NICKEL	3.10E+01	5.33E+01	0.00E+00	0.00E+00	2.30E-04	8.41E-04
POTASSIUM	2.03E+03	2.59E+03	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SELENIUM	3.40E-01	8.19E-01	0.00E+00	0.00E+00	1.01E-05	5.17E-05
SODIUM	1.56E+02	2.53E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00
THALLIUM	2.57E-01	3.83E-01	0.00E+00	0.00E+00	5.45E-04	1.73E-03
VANADIUM	3.01E+01	4.29E+01	0.00E+00	0.00E+00	6.38E-04	1.93E-03
ZINC	2.55E+02	6.16E+02	0.00E+00	0.00E+00	1.26E-04	6.48E-04
	TOTAL ADDITIONAL ESTIMATED CANCER RISK				HAZARD INDEX :	
			1.78E-06	1.60E-05	2.63E-02	1.03E-01

TABLE : 13

EXPOSURE SCENARIO FORMULA AND ASSUMPTIONS

EXPOSURE SCENARIO : CONSTRUCTION WORKER
SITE : LEICA SITE
SECTOR : SECTOR C SOIL
LOCATION : ON-SITE

EQUATION : INTAKE (mg/kg-day) =

$$\frac{CS \times CF \times SA \times AF \times MF \times ABS \times EF \times ED}{AT \times BW} + \frac{CS \times IR \times ABS \times CF \times EF \times ED}{AT \times BW} \times PTF$$

where :
CS = Chemical Concentration in Soil (mg/kg)
IR = Ingestion Rate (mg soil/day)
SA = Skin Surface Area Available for Contact (cm2/event)
CF = Conversion Factor (10E-06 kg/mg)
EF = Exposure Frequency (days/years)
ED = Exposure Duration (years)
BW = Body Weight (kg)
AT = Averaging Time (period over which exposure is averaged – days)
AF = Soil to Skin Adherence Factor (mg/cm2)
ABS = Absorption Factor (unitless)
MF = Matrix Factor; part of chemical on soil that is in contact with skin (%/100)
PTF = Percent of Time Factor: Percent of time in contaminated area. (%/100)

VARIABLE	MEAN	RME	REFERENCES
CS (mg/kg)	MEAN	95% UCL	RAGS (1,2)
IR - ADULT (mg/exposure)	50	50	RAGS (1,2)
SA - ADULT (cm2)	5300	5300	DEAP (3)
CF (kg/mg)	0.000001	0.000001	RAGS (1,2)
EF (days/year)	20	80	PROFESSIONAL JUDGEMENT
ED - ADULT (CARCINOGEN) (yrs)	1	1	RAGS (1,2)
ED (NON-CARCINOGEN) (yrs)	1	1	RAGS (1,2)
BW - ADULT (kg)	70	70	RAGS (1,2)
AT (CARCINOGEN) (yrs x days /yr)	25550	25550	RAGS (1,2)
AT (NON - CARCINOGEN) (yrs x days /yr)	365	365	RAGS (1,2)
AF (mg/cm2)	0.2	1	DEAP (3)
MF	0.15	0.15	HAWLEY (4)
ABS ORAL (CHEMICAL SPECIFIC)			
DERMAL (CHEMICAL SPECIFIC)			
PTF	1	1	PROFESSIONAL JUDGEMENT

NOTE :
(1) EPA "RISK ASSESSMENT GUIDANCE FOR SUPERFUND MANUAL, DECEMBER 1989, EPA/540/1-89/002.
(2) SUPPLEMENTAL GUIDANCE: "STANDARD DEFAULT EXPOSRE FACTORS", OSWER DIRECTIVE: 9285.6-03, MARCH 25, 1991.
(3) EPA DERMAL EXPOSURE ASSESSMENT: PRINCIPLES AND APPLICATIONS, EPA/600/8-89/011B, JANUARY 1992.
(4) HAWLEY, J.K., "ASSESSMENT OF HEALTH RISK FROM EXPOSURE TO CONTAMINATED SOIL", RISK ANALYSIS, VOL.5 NO.4, 1985.

TABLE : 14

MEDIA CONCENTRATIONS/CONSTANTS

EXPOSURE SCENARIO : CONSTRUCTION WORKER
SITE : LEICA SITE
SECTOR : SECTOR C SOIL
LOCATION : ON-SITE

	MEDIA CONCENTRATION				ORAL BIOAVAIL. FACTOR		DERMAL BIOAVAIL. FACTOR	
PARAMETER	MEAN mg/kg	RME mg/kg	ORAL CSF 1/(mg/kg/d)	ORAL RfD mg/kg/d	MEAN %/100	RME %/100	MEAN %/100	RME %/100
VOCs								
ACETONE	3.24E+00	9.00E-02	NA	1.00E-01	1	1	0.25	0.25
BENZENE	3.23E+00	2.00E-02	2.90E-02	NA	1	1	0.25	0.25
2-BUTANONE	3.23E+00	1.50E-02	NA	6.00E-01	1	1	0.25	0.25
CARBON DISULFIDE	3.23E+00	1.80E-02	NA	1.00E-01	1	1	0.25	0.25
1,1-DICHLOROETHANE	3.26E+00	1.32E-01	NA	1.00E-01	1	1	0.25	0.25
1,1-DICHLOROETHENE	3.26E+00	1.20E-01	6.00E-01	9.00E-03	1	1	0.25	0.25
1,2-DICHLOROETHENE (TOTAL)	3.58E+00	8.15E+00	NA	9.00E-03	1	1	0.25	0.25
ETHYLBENZENE	3.78E+00	8.09E+00	NA	1.00E-01	1	1	0.25	0.25
METHYLENE CHLORIDE	3.23E+00	9.30E-02	7.50E-03	6.00E-02	1	1	0.25	0.25
TETRACHLOROETHENE	3.23E+00	1.00E-02	5.10E-02	1.00E-02	1	1	0.25	0.25
TOLUENE	3.24E+00	1.80E+00	NA	2.00E-01	1	1	0.25	0.25
1,1,1-TRICHLOROETHANE	4.42E+00	8.85E+00	NA	9.00E-02	1	1	0.25	0.25
TRICHLOROETHENE	9.45E+01	2.31E+02	NA	NA	1	1	0.25	0.25
VINYL CHLORIDE	3.23E+00	5.00E-03	1.90E+00	NA	1	1	0.25	0.25
XYLENES (TOTAL)	8.97E+00	1.71E+01	NA	2.00E+00	1	1	0.25	0.25
SVOCs								
BENZO (a) ANTHRACENE	1.53E-01	2.00E-01	7.30E-01	NA	1	1	0.1	0.1
BENZO (b) FLUORANTHENE	1.71E-01	1.40E-01	7.30E-01	NA	1	1	0.1	0.1
BENZO (k) FLUORANTHENE	1.46E-01	3.70E-02	7.30E-02	NA	1	1	0.1	0.1
BENZO (g,h,i) PERYLENE	1.69E-01	1.30E-01	NA	NA	1	1	0.1	0.1
BENZO (a) PYRENE	1.45E-01	6.10E-02	7.30E+00	NA	1	1	0.1	0.1
CHRYSENE	1.40E-01	1.30E-01	7.30E-03	NA	1	1	0.1	0.1
DI-n-BUTYL PHTHALATE	5.39E-01	1.70E+00	NA	1.00E-01	1	1	0.1	0.1
FLUORANTHENE	2.39E-01	4.10E-01	NA	4.00E-02	1	1	0.1	0.1
INDENO (1,2,3-cd) PYRENE	1.71E-01	1.40E-01	7.30E-01	NA	1	1	0.1	0.1
2-METHYLNAPHTHALENE	1.66E-01	1.20E-01	NA	NA	1	1	0.1	0.1
NAPHTHALENE	2.09E-01	2.90E-01	NA	NA	1	1	0.1	0.1
PHENANTHRENE	1.69E-01	1.90E-01	NA	NA	1	1	0.1	0.1
PYRENE	1.69E-01	2.10E-01	NA	3.00E-02	1	1	0.1	0.1
ACID EXTRACTABLES								
2,4-DIMETHYLPHENOL	3.24E-01	7.50E-01	NA	2.00E-02	1	1	0.1	0.1
2-METHYLPHENOL	2.79E-01	5.70E-01	NA	5.00E-02	1	1	0.1	0.1
4-METHYLPHENOL	2.31E-01	3.80E-01	NA	5.00E-03	1	1	0.1	0.1
PHENOL	2.04E-01	2.70E-01	NA	6.00E-01	1	1	0.1	0.1
METALS								
ALUMINUM	9.59E+03	1.28E+04	NA	NA	1	1	0.01	0.01
ARSENIC	2.75E+00	3.85E+00	1.75E+00	3.00E-04	1	1	0.01	0.01
BARIUM	9.66E+01	1.45E+02	NA	7.00E-02	1	1	0.01	0.01
BERYLLIUM	4.45E-01	6.97E-01	4.30E+00	5.00E-03	1	1	0.01	0.01
CADMIUM	5.81E-01	9.20E-01	NA	5.00E-04	1	1	0.01	0.01
CALCIUM	6.49E+04	8.26E+04	NA	NA	1	1	0.01	0.01
CHROMIUM	1.41E+01	1.81E+01	NA	NA	1	1	0.01	0.01
COBALT	6.71E+00	8.69E+00	NA	NA	1	1	0.01	0.01
COPPER	4.25E+01	9.34E+01	NA	3.70E-02	1	1	0.01	0.01
IRON	1.65E+04	2.10E+04	NA	NA	1	1	0.01	0.01
LEAD	1.92E+01	3.26E+01	NA	1.40E-03	1	1	0.01	0.01
MAGNESIUM	1.96E+04	2.56E+04	NA	NA	1	1	0.01	0.01
MANGANESE	5.28E+02	7.03E+02	NA	5.00E-03	1	1	0.01	0.01
MERCURY	5.88E-02	9.16E-02	NA	NA	1	1	0.01	0.01
NICKEL	3.29E+01	6.88E+01	NA	2.00E-02	1	1	0.01	0.01
POTASSIUM	1.55E+03	1.93E+03	NA	NA	1	1	0.01	0.01
SELENIUM	2.34E-01	3.89E-01	NA	5.00E-03	1	1	0.01	0.01
SODIUM	2.66E+02	4.38E+02	NA	NA	1	1	0.01	0.01
THALLIUM	1.91E-01	2.42E-01	NA	7.00E-05	1	1	0.01	0.01
VANADIUM	1.91E+01	2.40E+01	NA	7.00E-03	1	1	0.01	0.01
ZINC	7.48E+01	9.09E+01	NA	3.00E-01	1	1	0.01	0.01

TABLE : 15

EXPOSURE, RISK AND HAZARD CALCULATIONS

EXPOSURE SCENARIO : CONSTRUCTION WORKER
SITE : LEICA SITE
SECTOR : SECTOR C SOIL
LOCATION : ON-SITE

	LIFETIME AVERAGE DAILY INTAKE (mg/kg/day)		LIFETIME UPPER BOUND EXCESS CANCER RISK		ANNUAL AVERAGE DAILY INTAKE (mg/kg/day)		HAZARD QUOTIENT CDI/RfD	
PARAMETER	MEAN	RME	MEAN	RME	MEAN	RME	MEAN	RME
VOCs								
ACETONE	3.25E-09	1.00E-09	0.00E+00	0.00E+00	2.28E-07	7.01E-08	2.28E-06	7.01E-07
BENZENE	3.24E-09	2.23E-10	9.40E-11	6.45E-12	2.27E-07	1.56E-08	0.00E+00	0.00E+00
2-BUTANONE	3.24E-09	1.67E-10	0.00E+00	0.00E+00	2.27E-07	1.17E-08	3.78E-07	1.95E-08
CARBON DISULFIDE	3.24E-09	2.00E-10	0.00E+00	0.00E+00	2.27E-07	1.40E-08	2.27E-06	1.40E-07
1,1-DICHLOROETHANE	3.27E-09	1.47E-09	0.00E+00	0.00E+00	2.29E-07	1.03E-07	2.29E-06	1.03E-06
1,1-DICHLOROETHENE	3.27E-09	1.34E-09	1.96E-09	8.01E-10	2.29E-07	9.35E-08	2.54E-05	1.04E-05
1,2-DICHLOROETHENE (TOTAL)	3.59E-09	9.07E-08	0.00E+00	0.00E+00	2.52E-07	6.35E-06	2.79E-05	7.05E-04
ETHYLBENZENE	3.79E-09	9.00E-08	0.00E+00	0.00E+00	2.66E-07	6.30E-06	2.66E-06	6.30E-05
METHYLENE CHLORIDE	3.24E-09	1.03E-09	2.43E-11	7.76E-12	2.27E-07	7.24E-08	3.78E-06	1.21E-06
TETRACHLOROETHENE	3.24E-09	1.11E-10	1.65E-10	5.67E-12	2.27E-07	7.79E-09	2.27E-05	7.79E-07
TOLUENE	3.25E-09	2.00E-08	0.00E+00	0.00E+00	2.28E-07	1.40E-06	1.14E-06	7.01E-06
1,1,1-TRICHLOROETHANE	4.44E-09	9.85E-08	0.00E+00	0.00E+00	3.11E-07	6.89E-06	3.45E-06	7.66E-05
TRICHLOROETHENE	9.48E-08	2.57E-06	0.00E+00	0.00E+00	6.64E-06	1.80E-04	0.00E+00	0.00E+00
VINYL CHLORIDE	3.24E-09	5.56E-11	6.16E-09	1.06E-10	2.27E-07	3.89E-09	0.00E+00	0.00E+00
XYLENES (TOTAL)	9.00E-09	1.90E-07	0.00E+00	0.00E+00	6.30E-07	1.33E-05	3.15E-07	6.66E-06
SVOCs								
BENZO (a) ANTHRACENE	1.13E-10	1.16E-09	8.23E-11	8.46E-10	7.89E-09	8.11E-08	0.00E+00	0.00E+00
BENZO (b) FLUORANTHENE	1.26E-10	8.11E-10	9.20E-11	5.92E-10	8.82E-09	5.68E-08	0.00E+00	0.00E+00
BENZO (k) FLUORANTHENE	1.08E-10	2.14E-10	7.85E-12	1.56E-11	7.53E-09	1.50E-08	0.00E+00	0.00E+00
BENZO (g,h,i) PERYLENE	1.25E-10	7.53E-10	0.00E+00	0.00E+00	8.72E-09	5.27E-08	0.00E+00	0.00E+00
BENZO (a) PYRENE	1.07E-10	3.53E-10	7.80E-10	2.58E-09	7.48E-09	2.47E-08	0.00E+00	0.00E+00
CHRYSENE	1.03E-10	7.53E-10	7.53E-13	5.50E-12	7.22E-09	5.27E-08	0.00E+00	0.00E+00
DI-n-BUTYL PHTHALATE	3.97E-10	9.85E-09	0.00E+00	0.00E+00	2.78E-08	6.89E-07	2.78E-07	6.89E-06
FLUORANTHENE	1.76E-10	2.37E-09	0.00E+00	0.00E+00	1.23E-08	1.66E-07	3.08E-07	4.16E-06
INDENO (1,2,3-cd) PYRENE	1.26E-10	8.11E-10	9.20E-11	5.92E-10	8.82E-09	5.68E-08	0.00E+00	0.00E+00
2-METHYLNAPHTHALENE	1.22E-10	6.95E-10	0.00E+00	0.00E+00	8.56E-09	4.87E-08	0.00E+00	0.00E+00
NAPHTHALENE	1.54E-10	1.68E-09	0.00E+00	0.00E+00	1.08E-08	1.18E-07	0.00E+00	0.00E+00
PHENANTHRENE	1.25E-10	1.10E-09	0.00E+00	0.00E+00	8.72E-09	7.70E-08	0.00E+00	0.00E+00
PYRENE	1.25E-10	1.22E-09	0.00E+00	0.00E+00	8.72E-09	8.52E-08	2.91E-07	2.84E-06
ACID EXTRACTABLES								
2,4-DIMETHYLPHENOL	2.39E-10	4.34E-09	0.00E+00	0.00E+00	1.67E-08	3.04E-07	8.36E-07	1.52E-05
2-METHYLPHENOL	2.06E-10	3.30E-09	0.00E+00	0.00E+00	1.44E-08	2.31E-07	2.88E-07	4.62E-06
4-METHYLPHENOL	1.70E-10	2.20E-09	0.00E+00	0.00E+00	1.19E-08	1.54E-07	2.38E-06	3.08E-05
PHENOL	1.50E-10	1.56E-09	0.00E+00	0.00E+00	1.05E-08	1.09E-07	1.75E-08	1.82E-07
METALS								
ALUMINUM	5.53E-06	3.32E-05	0.00E+00	0.00E+00	3.87E-04	2.32E-03	0.00E+00	0.00E+00
ARSENIC	1.59E-09	9.98E-09	2.78E-09	1.75E-08	1.11E-07	6.99E-07	3.70E-04	2.33E-03
BARIUM	5.57E-08	3.76E-07	0.00E+00	0.00E+00	3.90E-06	2.63E-05	5.57E-05	3.76E-04
BERYLLIUM	2.57E-10	1.81E-09	1.10E-09	7.77E-09	1.80E-08	1.26E-07	3.59E-06	2.53E-05
CADMIUM	3.35E-10	2.38E-09	0.00E+00	0.00E+00	2.35E-08	1.67E-07	4.69E-05	3.34E-04
CALCIUM	3.74E-05	2.14E-04	0.00E+00	0.00E+00	2.62E-03	1.50E-02	0.00E+00	0.00E+00
CHROMIUM	8.13E-09	4.69E-08	0.00E+00	0.00E+00	5.69E-07	3.28E-06	0.00E+00	0.00E+00
COBALT	3.87E-09	2.25E-08	0.00E+00	0.00E+00	2.71E-07	1.58E-06	0.00E+00	0.00E+00
COPPER	2.45E-08	2.42E-07	0.00E+00	0.00E+00	1.72E-06	1.69E-05	4.64E-05	4.58E-04
IRON	9.52E-06	5.44E-05	0.00E+00	0.00E+00	6.66E-04	3.81E-03	0.00E+00	0.00E+00
LEAD	1.11E-08	8.45E-08	0.00E+00	0.00E+00	7.75E-07	5.92E-06	5.54E-04	4.23E-03
MAGNESIUM	1.13E-05	6.64E-05	0.00E+00	0.00E+00	7.92E-04	4.65E-03	0.00E+00	0.00E+00
MANGANESE	3.05E-07	1.82E-06	0.00E+00	0.00E+00	2.13E-05	1.28E-04	4.26E-03	2.55E-02
MERCURY	3.39E-11	2.37E-10	0.00E+00	0.00E+00	2.37E-09	1.66E-08	0.00E+00	0.00E+00
NICKEL	1.90E-08	1.78E-07	0.00E+00	0.00E+00	1.33E-06	1.25E-05	6.64E-05	6.24E-04
POTASSIUM	8.94E-07	5.00E-06	0.00E+00	0.00E+00	6.26E-05	3.50E-04	0.00E+00	0.00E+00
SELENIUM	1.35E-10	1.01E-09	0.00E+00	0.00E+00	9.45E-09	7.06E-08	1.89E-06	1.41E-05
SODIUM	1.53E-07	1.14E-06	0.00E+00	0.00E+00	1.07E-05	7.95E-05	0.00E+00	0.00E+00
THALLIUM	1.10E-10	6.27E-10	0.00E+00	0.00E+00	7.71E-09	4.39E-08	1.10E-04	6.27E-04
VANADIUM	1.10E-08	6.22E-08	0.00E+00	0.00E+00	7.71E-07	4.35E-06	1.10E-04	6.22E-04
ZINC	4.32E-08	2.36E-07	0.00E+00	0.00E+00	3.02E-06	1.65E-05	1.01E-05	5.50E-05
	TOTAL ADDITIONAL ESTIMATED CANCER RISKS :						HAZARD INDEX :	
			1.33E-08	3.08E-08			5.74E-03	3.61E-02

TABLE : 16

SUMMARY TABLE

EXPOSURE SCENARIO : CONSTRUCTION WORKER
SITE : LEICA SITE
SECTOR : SECTOR C SOIL
LOCATION : ON-SITE

	MEDIA CONCENTRATION		LIFETIME UPPER BOUND EXCESS CANCER RISK		HAZARD QUOTIENT CDI/RfD	
PARAMETER	MEAN mg/kg	RME mg/kg	MEAN	RME	MEAN	RME
VOCs						
ACETONE	3.24E+00	9.00E-02	0.00E+00	0.00E+00	2.28E-06	7.01E-07
BENZENE	3.23E+00	2.00E-02	9.40E-11	6.45E-12	0.00E+00	0.00E+00
2-BUTANONE	3.23E+00	1.50E-02	0.00E+00	0.00E+00	3.78E-07	1.95E-08
CARBON DISULFIDE	3.23E+00	1.80E-02	0.00E+00	0.00E+00	2.27E-06	1.40E-07
1,1-DICHLOROETHANE	3.26E+00	1.32E-01	0.00E+00	0.00E+00	2.29E-06	1.03E-06
1,1-DICHLOROETHENE	3.26E+00	1.20E-01	1.96E-09	8.01E-10	2.54E-05	1.04E-05
1,2-DICHLOROETHENE (TOTAL)	3.58E+00	8.15E+00	0.00E+00	0.00E+00	2.79E-05	7.05E-04
ETHYLBENZENE	3.78E+00	8.09E+00	0.00E+00	0.00E+00	2.66E-06	6.30E-05
METHYLENE CHLORIDE	3.23E+00	9.30E-02	2.43E-11	7.76E-12	3.78E-06	1.21E-06
TETRACHLOROETHENE	3.23E+00	1.00E-02	1.65E-10	5.67E-12	2.27E-05	7.79E-07
TOLUENE	3.24E+00	1.80E+00	0.00E+00	0.00E+00	1.14E-06	7.01E-06
1,1,1-TRICHLOROETHANE	4.42E+00	8.85E+00	0.00E+00	0.00E+00	3.45E-06	7.66E-05
TRICHLOROETHENE	9.45E+01	2.31E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00
VINYL CHLORIDE	3.23E+00	5.00E-03	6.16E-09	1.06E-10	0.00E+00	0.00E+00
XYLENES (TOTAL)	8.97E+00	1.71E+01	0.00E+00	0.00E+00	3.15E-07	6.66E-06
SVOCs						
BENZO (a) ANTHRACENE	1.53E-01	2.00E-01	8.23E-11	8.46E-10	0.00E+00	0.00E+00
BENZO (b) FLUORANTHENE	1.71E-01	1.40E-01	9.20E-11	5.92E-10	0.00E+00	0.00E+00
BENZO (k) FLUORANTHENE	1.46E-01	3.70E-02	7.85E-12	1.56E-11	0.00E+00	0.00E+00
BENZO (g,h,i) PERYLENE	1.69E-01	1.30E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BENZO (a) PYRENE	1.45E-01	6.10E-02	7.80E-10	2.58E-09	0.00E+00	0.00E+00
CHRYSENE	1.40E-01	1.30E-01	7.53E-13	5.50E-12	0.00E+00	0.00E+00
DI-n-BUTYL PHTHALATE	5.39E-01	1.70E+00	0.00E+00	0.00E+00	2.78E-07	6.89E-06
FLUORANTHENE	2.39E-01	4.10E-01	0.00E+00	0.00E+00	3.08E-07	4.16E-06
INDENO (1,2,3-cd) PYRENE	1.71E-01	1.40E-01	9.20E-11	5.92E-10	0.00E+00	0.00E+00
2-METHYLNAPHTHALENE	1.66E-01	1.20E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NAPHTHALENE	2.09E-01	2.90E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PHENANTHRENE	1.69E-01	1.90E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PYRENE	1.69E-01	2.10E-01	0.00E+00	0.00E+00	2.91E-07	2.84E-06
ACID EXTRACTABLES						
2,4-DIMETHYLPHENOL	3.24E-01	7.50E-01	0.00E+00	0.00E+00	8.36E-07	1.52E-05
2-METHYLPHENOL	2.79E-01	5.70E-01	0.00E+00	0.00E+00	2.88E-07	4.62E-06
4-METHYLPHENOL	2.31E-01	3.80E-01	0.00E+00	0.00E+00	2.38E-06	3.08E-05
PHENOL	2.04E-01	2.70E-01	0.00E+00	0.00E+00	1.75E-08	1.82E-07
METALS						
ALUMINUM	9.59E+03	1.28E+04	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ARSENIC	2.75E+00	3.85E+00	2.78E-09	1.75E-08	3.70E-04	2.33E-03
BARIUM	9.66E+01	1.45E+02	0.00E+00	0.00E+00	5.57E-05	3.76E-04
BERYLLIUM	4.45E-01	6.97E-01	1.10E-09	7.77E-09	3.59E-06	2.53E-05
CADMIUM	5.81E-01	9.20E-01	0.00E+00	0.00E+00	4.69E-05	3.34E-04
CALCIUM	6.49E+04	8.26E+04	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHROMIUM	1.41E+01	1.81E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00
COBALT	6.71E+00	8.69E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
COPPER	4.25E+01	9.34E+01	0.00E+00	0.00E+00	4.64E-05	4.58E-04
IRON	1.65E+04	2.10E+04	0.00E+00	0.00E+00	0.00E+00	0.00E+00
LEAD	1.92E+01	3.26E+01	0.00E+00	0.00E+00	5.54E-04	4.23E-03
MAGNESIUM	1.96E+04	2.56E+04	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MANGANESE	5.28E+02	7.03E+02	0.00E+00	0.00E+00	4.26E-03	2.55E-02
MERCURY	5.88E-02	9.16E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NICKEL	3.29E+01	6.88E+01	0.00E+00	0.00E+00	6.64E-05	6.24E-04
POTASSIUM	1.55E+03	1.93E+03	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SELENIUM	2.34E-01	3.89E-01	0.00E+00	0.00E+00	1.89E-06	1.41E-05
SODIUM	2.66E+02	4.38E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00
THALLIUM	1.91E-01	2.42E-01	0.00E+00	0.00E+00	1.10E-04	6.27E-04
VANADIUM	1.91E+01	2.40E+01	0.00E+00	0.00E+00	1.10E-04	6.22E-04
ZINC	7.48E+01	9.09E+01	0.00E+00	0.00E+00	1.01E-05	5.50E-05
	TOTAL ADDITIONAL ESTIMATED CANCER RISK				HAZARD INDEX :	
			1.33E-08	3.08E-08	5.74E-03	3.61E-02

TABLE : 17

EXPOSURE SCENARIO FORMULA AND ASSUMPTIONS

RESIDENTIAL EXPOSURE SCENARIO : DRINKING WATER
INGESTION OF CHEMICALS IN DRINKING WATER

EQUATION : INTAKE (mg/kg-day) = $\frac{CW \times IR \times EF \times ED}{BW \times AT}$

where :

CW = Chemical Concentration in Water (mg/liter)
IR = Ingestion Rate (liters/day)
EF = Exposure Frequency (days/year)
ED = Exposure Duration (years)
BW = Body Weight (kg)
AT = Averaging Time (period over which exposure is averaged)

VARIABLE	MEAN	RME	REFERENCE
CW (mg/liter)	MEAN	95% UCL	
IR child (L)	1	1	RAGS (1)
BW CHILD (kg)	16	16	RAGS (1)
EF (days/yr)	350	350	RAGS (2)
ED - carcinogen (years)	5	5	RAGS (1)
ED - non-carcinogen (years)	1	1	RAGS (1)
AT - carcinogen (years x days)	25550	25550	RAGS (1)
AT - non-carcinogen (years x days)	365	365	RAGS (1)

NOTE:
(1) USEPA RISK ASSESSMENT GUIDANCE FOR SUPERFUND (RAGS), VOLUME I, HUMAN HEALTH EVALUATION MANUAL, EPA/540/1-89/002, DECEMBER 1989.
(2) USEPA "RISK ASSESSMENT GUIDANCE FOR SUPERFUND (RAGS), VOLUME I, HUMAN HEALTH EVALUATION MANUAL, SUPPLEMENTAL GUIDANCE, STANDARD EXPOSURE FACTORS", OSWER DIRECTIVE 9285.6-03, MARCH 25, 1991.

TABLE : 18

MEDIA CONCENTRATIONS/CONSTANTS

SITE : LEICA INC.
SECTOR : GROUNDWATER
LOCATION : ON-SITE
MEDIA : GROUNDWATER
EXPOSURE SCENARIO : DRINKING WATER-CHILD

	MEDIA CONCENTRATION			
PARAMETER	MEAN mg/L	RME mg/L	ORAL CSF 1/(mg/kg/d)	ORAL RfD mg/kg/d
VOCs				
ACETONE	1.21E+01	7.40E-02	NA	1.00E-01
BENZENE	1.03E+01	1.90E-01	2.90E-02	NA
1,1-DICHLOROETHANE	1.08E+01	6.50E+00	NA	1.00E-01
1,1-DICHLOROETHENE	1.16E+01	1.20E+00	6.00E-01	9.00E-03
1,2-DICHLOROETHENE (TOTAL)	4.73E+02	1.30E+03	NA	9.00E-03
ETHYLBENZENE	1.87E+01	5.34E+01	NA	1.00E-01
METHYLENE CHLORIDE	1.04E+01	1.20E-01	7.50E-03	6.00E-02
TETRACHLOROETHENE	3.82E+00	9.98E+00	5.10E-02	1.00E-02
TOLUENE	1.17E+01	2.70E+00	NA	2.00E-01
1,1,1-TRCHLOROETHANE	1.25E+01	3.21E+01	NA	9.00E-02
TRICHLOROETHENE	6.25E+03	1.87E+04	NA	NA
VINYL CHLORIDE	3.59E+01	8.86E+01	1.90E+00	NA
XYLENES (TOTAL)	1.27E+02	3.76E+02	NA	2.00E+00
SVOCs				
BIS(2-ETHYLHEXYL) PHTHALATE	1.00E-02	1.89E-02	1.40E-02	2.00E-02
1,2-DICHLOROBENZENE	6.90E-03	4.00E-03	NA	9.00E-02
NAPHTHALENE	1.04E-02	1.95E-02	NA	NA
ACID EXTRACTABLES				
4-CHLORO-3-METHYLPHENOL	8.40E-03	1.36E-02	NA	NA
2,4-DIMETHYLPHENOL	1.10E-02	1.93E-02	NA	2.00E-02
2-METHYLPHENOL	1.24E-02	2.61E-02	NA	5.00E-02
4-METHYLPHENOL	6.52E-02	1.88E-01	NA	5.00E-03
PHENOL	1.03E-01	3.23E-01	NA	6.00E-01
METALS				
ALUMINUM	7.22E+00	1.53E+01	NA	NA
ARSENIC	5.06E-03	7.32E-03	1.75E+00	3.00E-04
BARIUM	2.37E-01	3.31E-01	NA	7.00E-02
CALCIUM	2.10E+02	3.23E+02	NA	NA
CHROMIUM	3.19E-02	5.71E-02	NA	NA
COBALT	1.17E-02	2.04E-02	NA	NA
COPPER	2.59E-02	4.58E-02	NA	3.70E-02
IRON	1.44E+01	2.59E+01	NA	NA
LEAD	1.53E-02	3.70E-02	NA	1.40E-03
MAGNESIUM	1.21E+02	2.00E+02	NA	NA
MANGANESE	4.13E-01	7.90E-01	NA	5.00E-03
NICKEL	4.84E-02	9.77E-02	NA	2.00E-02
POTASSIUM	6.61E+00	9.59E+00	NA	NA
SODIUM	1.55E+02	2.81E+02	NA	NA
VANADIUM	1.19E-02	2.45E-02	NA	7.00E-03
ZINC	1.66E-01	3.14E-01	NA	3.00E-01

TABLE : 19

EXPOSURE, RISK AND HAZARD CALCULATIONS

SITE : LEICA INC.
SECTOR : GROUNDWATER
LOCATION : ON-SITE
MEDIA : GROUNDWATER
EXPOSURE SCENARIO : DRINKING WATER-CHILD

	LIFETIME AVERAGE DAILY INTAKE (mg/kg/day)		LIFETIME UPPER BOUND EXCESS CANCER RISK		ANNUAL AVERAGE DAILY INTAKE (mg/kg/day)		HAZARD QUOTIENT CDI/RfD	
PARAMETER	MEAN	RME	MEAN	RME	MEAN	RME	MEAN	RME
VOCs								
ACETONE	5.18E-02	3.17E-04	0.00E+00	0.00E+00	7.25E-01	2.22E-02	7.25E+00	2.22E-01
BENZENE	4.41E-02	8.13E-04	1.28E-03	2.36E-05	6.17E-01	5.69E-02	0.00E+00	0.00E+00
1,1-DICHLOROETHANE	4.62E-02	2.78E-02	0.00E+00	0.00E+00	6.47E-01	1.95E+00	6.47E+00	1.95E+01
1,1-DICHLOROETHENE	4.97E-02	5.14E-03	2.98E-02	3.08E-03	6.95E-01	3.60E-01	7.72E+01	4.00E+01
1,2-DICHLOROETHENE (TOTAL)	2.02E+00	5.57E+00	0.00E+00	0.00E+00	2.83E+01	3.90E+02	3.15E+03	4.33E+04
ETHYLBENZENE	8.01E-02	2.29E-01	0.00E+00	0.00E+00	1.12E+00	1.60E+01	1.12E+01	1.60E+02
METHYLENE CHLORIDE	4.45E-02	5.14E-04	3.34E-04	3.85E-06	6.23E-01	3.60E-02	1.04E+01	5.99E-01
TETRACHLOROETHENE	1.64E-02	4.27E-02	8.34E-04	2.18E-03	2.29E-01	2.99E+00	2.29E+01	2.99E+02
TOLUENE	5.01E-02	1.16E-02	0.00E+00	0.00E+00	7.01E-01	8.09E-01	3.51E+00	4.05E+00
1,1,1-TRCHLOROETHANE	5.35E-02	1.37E-01	0.00E+00	0.00E+00	7.49E-01	9.62E+00	8.32E+00	1.07E+02
TRICHLOROETHENE	2.68E+01	8.01E+01	0.00E+00	0.00E+00	3.75E+02	5.60E+03	0.00E+00	0.00E+00
VINYL CHLORIDE	1.54E-01	3.79E-01	2.92E-01	7.21E-01	2.15E+00	2.65E+01	0.00E+00	0.00E+00
XYLENES (TOTAL)	5.44E-01	1.61E+00	0.00E+00	0.00E+00	7.61E+00	1.13E+02	3.81E+00	5.63E+01
SVOCs								
IS(2-ETHYLHEXYL) PHTHALATE	4.28E-05	8.09E-05	5.99E-07	1.13E-06	5.99E-04	5.66E-03	3.00E-02	2.83E-01
1,2-DICHLOROBENZENE	2.95E-05	1.71E-05	0.00E+00	0.00E+00	4.14E-04	1.20E-03	4.59E-03	1.33E-02
NAPHTHALENE	4.45E-05	8.35E-05	0.00E+00	0.00E+00	6.23E-04	5.84E-03	0.00E+00	0.00E+00
ACID EXTRACTABLES								
4-CHLORO-3-METHYLPHENOL	3.60E-05	5.82E-05	0.00E+00	0.00E+00	5.03E-04	4.08E-03	0.00E+00	0.00E+00
2,4-DIMETHYLPHENOL	4.71E-05	8.26E-05	0.00E+00	0.00E+00	6.59E-04	5.78E-03	3.30E-02	2.89E-01
2-METHYLPHENOL	5.31E-05	1.12E-04	0.00E+00	0.00E+00	7.43E-04	7.82E-03	1.49E-02	1.56E-01
4-METHYLPHENOL	2.79E-04	8.05E-04	0.00E+00	0.00E+00	3.91E-03	5.63E-02	7.82E-01	1.13E+01
PHENOL	4.41E-04	1.38E-03	0.00E+00	0.00E+00	6.17E-03	9.68E-02	1.03E-02	1.61E-01
METALS								
ALUMINUM	3.09E-02	6.55E-02	0.00E+00	0.00E+00	4.33E-01	4.58E+00	0.00E+00	0.00E+00
ARSENIC	2.17E-05	3.13E-05	3.79E-05	5.48E-05	3.03E-04	2.19E-03	1.01E+00	7.31E+00
BARIUM	1.01E-03	1.42E-03	0.00E+00	0.00E+00	1.42E-02	9.92E-02	2.03E-01	1.42E+00
CALCIUM	8.99E-01	1.38E+00	0.00E+00	0.00E+00	1.26E+01	9.68E+01	0.00E+00	0.00E+00
CHROMIUM	1.37E-04	2.44E-04	0.00E+00	0.00E+00	1.91E-03	1.71E-02	0.00E+00	0.00E+00
COBALT	5.01E-05	8.73E-05	0.00E+00	0.00E+00	7.01E-04	6.11E-03	0.00E+00	0.00E+00
COPPER	1.11E-04	1.96E-04	0.00E+00	0.00E+00	1.55E-03	1.37E-02	4.20E-02	3.71E-01
IRON	6.16E-02	1.11E-01	0.00E+00	0.00E+00	8.63E-01	7.76E+00	0.00E+00	0.00E+00
LEAD	6.55E-05	1.58E-04	0.00E+00	0.00E+00	9.17E-04	1.11E-02	6.55E-01	7.92E+00
MAGNESIUM	5.18E-01	8.56E-01	0.00E+00	0.00E+00	7.25E+00	5.99E+01	0.00E+00	0.00E+00
MANGANESE	1.77E-03	3.38E-03	0.00E+00	0.00E+00	2.48E-02	2.37E-01	4.95E+00	4.73E+01
NICKEL	2.07E-04	4.18E-04	0.00E+00	0.00E+00	2.90E-03	2.93E-02	1.45E-01	1.46E+00
POTASSIUM	2.83E-02	4.11E-02	0.00E+00	0.00E+00	3.96E-01	2.87E+00	0.00E+00	0.00E+00
SODIUM	6.64E-01	1.20E+00	0.00E+00	0.00E+00	9.29E+00	8.42E+01	0.00E+00	0.00E+00
VANADIUM	5.09E-05	1.05E-04	0.00E+00	0.00E+00	7.13E-04	7.34E-03	1.02E-01	1.05E+00
ZINC	7.11E-04	1.34E-03	0.00E+00	0.00E+00	9.95E-03	9.41E-02	3.32E-02	3.14E-01
	TOTAL ADDITIONAL ESTIMATED CANCER RISKS :				**HAZARD INDEX :**			
			3.24E-01	7.26E-01			3.31E+03	4.40E+04

TABLE : 20

SUMMARY TABLE

SITE : LEICA INC.
SECTOR : GROUNDWATER
LOCATION : ON-SITE
MEDIA : GROUNDWATER
EXPOSURE SCENARIO : DRINKING WATER-CHILD

PARAMETER	MEDIA CONCENTRATION MEAN (mg/L)	MEDIA CONCENTRATION RME (mg/L)	LIFETIME UPPER BOUND EXCESS CANCER RISK MEAN	LIFETIME UPPER BOUND EXCESS CANCER RISK RME	HAZARD QUOTIENT CDI/RfD MEAN	HAZARD QUOTIENT CDI/RfD RME
VOCs						
ACETONE	1.21E+01	7.40E-02	0.00E+00	0.00E+00	7.25E+00	2.22E-01
BENZENE	1.03E+01	1.90E-01	1.28E-03	2.36E-05	0.00E+00	0.00E+00
1,1-DICHLOROETHANE	1.08E+01	6.50E+00	0.00E+00	0.00E+00	6.47E+00	1.95E+01
1,1-DICHLOROETHENE	1.16E+01	1.20E+00	2.98E-02	3.08E-03	7.72E+01	4.00E+01
1,2-DICHLOROETHENE (TOTAL)	4.73E+02	1.30E+03	0.00E+00	0.00E+00	3.15E+03	4.33E+04
ETHYLBENZENE	1.87E+01	5.34E+01	0.00E+00	0.00E+00	1.12E+01	1.60E+02
METHYLENE CHLORIDE	1.04E+01	1.20E-01	3.34E-04	3.85E-06	1.04E+01	5.99E-01
TETRACHLOROETHENE	3.82E+00	9.98E+00	8.34E-04	2.18E-03	2.29E+01	2.99E+02
TOLUENE	1.17E+01	2.70E+00	0.00E+00	0.00E+00	3.51E+00	4.05E+00
1,1,1-TRCHLOROETHANE	1.25E+01	3.21E+01	0.00E+00	0.00E+00	8.32E+00	1.07E+02
TRICHLOROETHENE	6.25E+03	1.87E+04	0.00E+00	0.00E+00	0.00E+00	0.00E+00
VINYL CHLORIDE	3.59E+01	8.86E+01	2.92E-01	7.21E-01	0.00E+00	0.00E+00
XYLENES (TOTAL)	1.27E+02	3.76E+02	0.00E+00	0.00E+00	3.81E+00	5.63E+01
SVOCs						
BIS(2-ETHYLHEXYL) PHTHALATE	1.00E-02	1.89E-02	5.99E-07	1.13E-06	3.00E-02	2.83E-01
1,2-DICHLOROBENZENE	6.90E-03	4.00E-03	0.00E+00	0.00E+00	4.59E-03	1.33E-02
NAPHTHALENE	1.04E-02	1.95E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ACID EXTRACTABLES						
4-CHLORO-3-METHYLPHENOL	8.40E-03	1.36E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2,4-DIMETHYLPHENOL	1.10E-02	1.93E-02	0.00E+00	0.00E+00	3.30E-02	2.89E-01
2-METHYLPHENOL	1.24E-02	2.61E-02	0.00E+00	0.00E+00	1.49E-02	1.56E-01
4-METHYLPHENOL	6.52E-02	1.88E-01	0.00E+00	0.00E+00	7.82E-01	1.13E+01
PHENOL	1.03E-01	3.23E-01	0.00E+00	0.00E+00	1.03E-02	1.61E-01
METALS						
ALUMINUM	7.22E+00	1.53E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ARSENIC	5.06E-03	7.32E-03	3.79E-05	5.48E-05	1.01E+00	7.31E+00
BARIUM	2.37E-01	3.31E-01	0.00E+00	0.00E+00	2.03E-01	1.42E+00
CALCIUM	2.10E+02	3.23E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHROMIUM	3.19E-02	5.71E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00
COBALT	1.17E-02	2.04E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00
COPPER	2.59E-02	4.58E-02	0.00E+00	0.00E+00	4.20E-02	3.71E-01
IRON	1.44E+01	2.59E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00
LEAD	1.53E-02	3.70E-02	0.00E+00	0.00E+00	6.55E-01	7.92E+00
MAGNESIUM	1.21E+02	2.00E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MANGANESE	4.13E-01	7.90E-01	0.00E+00	0.00E+00	4.95E+00	4.73E+01
NICKEL	4.84E-02	9.77E-02	0.00E+00	0.00E+00	1.45E-01	1.46E+00
POTASSIUM	6.61E+00	9.59E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SODIUM	1.55E+02	2.81E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00
VANADIUM	1.19E-02	2.45E-02	0.00E+00	0.00E+00	1.02E-01	1.05E+00
ZINC	1.66E-01	3.14E-01	0.00E+00	0.00E+00	3.32E-02	3.14E-01
TOTAL ADDITIONAL ESTIMATED CANCER RISKS HAZARD INDEX :			3.24E-01	7.26E-01	3.31E+03	4.40E+04

TABLE : 21

EXPOSURE SCENARIO FORMULA AND ASSUMPTIONS

RESIDENTIAL EXPOSURE SCENARIO : DRINKING WATER
INGESTION OF CHEMICALS IN DRINKING WATER

EQUATION : $$\text{INTAKE (mg/kg-day)} = \frac{CW \times IR \times EF \times ED}{BW \times AT}$$

where :

CW = Chemical Concentration in Water (mg/liter)
IR = Ingestion Rate (liters/day)
EF = Exposure Frequency (days/year)
ED = Exposure Duration (years)
BW = Body Weight (kg)
AT = Averaging Time (period over which exposure is averaged)

VARIABLE	MEAN	RME	REFERENCE
CW (mg/liter)	MEAN	95% UCL	
IR ADULT (L)	2	2	RAGS (1)
BW ADULT (kg)	70	70	RAGS (1)
EF (days/yr)	350	350	RAGS (2)
ED - carcinogen (years)	5	25	RAGS (1)
ED - non-carcinogen (years)	1	1	RAGS (1)
[illegible]T - carcinogen (years x days)	25550	25550	RAGS (1)
AT - non-carcinogen (years x days)	365	365	RAGS (1)

NOTE:
(1) USEPA RISK ASSESSMENT GUIDANCE FOR SUPERFUND (RAGS), VOLUME I, HUMAN HEALTH EVALUATION MANUAL, EPA/540/1-89/002, DECEMBER 1989.
(2) USEPA "RISK ASSESSMENT GUIDANCE FOR SUPERFUND (RAGS), VOLUME I, HUMAN HEALTH EVALUATION MANUAL, SUPPLEMENTAL GUIDANCE, STANDARD EXPOSURE FACTORS", OSWER DIRECTIVE 9285.6-03, MARCH 25, 1991.

TABLE : 22

MEDIA CONCENTRATIONS/CONSTANTS

SITE : LEICA INC.
SECTOR : GROUNDWATER
LOCATION : ON-SITE
MEDIA : GROUNDWATER
EXPOSURE SCENARIO : DRINKING WATER-OLDER CHILD AND ADULT

	MEDIA CONCENTRATION			
PARAMETER	MEAN mg/L	RME mg/L	ORAL CSF 1/(mg/kg/d)	ORAL RfD mg/kg/d
VOCs				
ACETONE	1.21E+01	7.40E-02	NA	1.00E-01
BENZENE	1.03E+01	1.90E-01	2.90E-02	NA
1,1-DICHLOROETHANE	1.08E+01	6.50E+00	NA	1.00E-01
1,1-DICHLOROETHENE	1.16E+01	1.20E+00	6.00E-01	9.00E-03
1,2-DICHLOROETHENE (TOTAL)	4.73E+02	1.30E+03	NA	9.00E-03
ETHYLBENZENE	1.87E+01	5.34E+01	NA	1.00E-01
METHYLENE CHLORIDE	1.04E+01	1.20E-01	7.50E-03	6.00E-02
TETRACHLOROETHENE	3.82E+00	9.98E+00	5.10E-02	1.00E-02
TOLUENE	1.17E+01	2.70E+00	NA	2.00E-01
1,1,1-TRCHLOROETHANE	1.25E+01	3.21E+01	NA	9.00E-02
TRICHLOROETHENE	6.25E+03	1.87E+04	NA	NA
VINYL CHLORIDE	3.59E+01	8.86E+01	1.90E+00	NA
XYLENES (TOTAL)	1.27E+02	3.76E+02	NA	2.00E+00
SVOCs				
BIS(2-ETHYLHEXYL) PHTHALATE	1.00E-02	1.89E-02	1.40E-02	2.00E-02
1,2-DICHLOROBENZENE	6.90E-03	4.00E-03	NA	9.00E-02
NAPHTHALENE	1.04E-02	1.95E-02	NA	NA
ACID EXTRACTABLES				
4-CHLORO-3-METHYLPHENOL	8.40E-03	1.36E-02	NA	NA
2,4-DIMETHYLPHENOL	1.10E-02	1.93E-02	NA	2.00E-02
2-METHYLPHENOL	1.24E-02	2.61E-02	NA	5.00E-02
4-METHYLPHENOL	6.52E-02	1.88E-01	NA	5.00E-03
PHENOL	1.03E-01	3.23E-01	NA	6.00E-01
METALS				
ALUMINUM	7.22E+00	1.53E+01	NA	NA
ARSENIC	5.06E-03	7.32E-03	1.75E+00	3.00E-04
BARIUM	2.37E-01	3.31E-01	NA	7.00E-02
CALCIUM	2.10E+02	3.23E+02	NA	NA
CHROMIUM	3.19E-02	5.71E-02	NA	NA
COBALT	1.17E-02	2.04E-02	NA	NA
COPPER	2.59E-02	4.58E-02	NA	3.70E-02
IRON	1.44E+01	2.59E+01	NA	NA
LEAD	1.53E-02	3.70E-02	NA	1.40E-03
MAGNESIUM	1.21E+02	2.00E+02	NA	NA
MANGANESE	4.13E-01	7.90E-01	NA	5.00E-03
NICKEL	4.84E-02	9.77E-02	NA	2.00E-02
POTASSIUM	6.61E+00	9.59E+00	NA	NA
SODIUM	1.55E+02	2.81E+02	NA	NA
VANADIUM	1.19E-02	2.45E-02	NA	7.00E-03
ZINC	1.66E-01	3.14E-01	NA	3.00E-01

TABLE : 23

EXPOSURE, RISK AND HAZARD CALCULATIONS

SITE : LEICA INC.
SECTOR : GROUNDWATER
LOCATION : ON-SITE
MEDIA : GROUNDWATER
EXPOSURE SCENARIO : DRINKING WATER-OLDER CHILD AND ADULT

	LIFETIME AVERAGE DAILY INTAKE (mg/kg/day)		LIFETIME UPPER BOUND EXCESS CANCER RISK		ANNUAL AVERAGE DAILY INTAKE (mg/kg/day)		HAZARD QUOTIENT CDI/RfD	
PARAMETER	MEAN	RME	MEAN	RME	MEAN	RME	MEAN	RME
VOCs								
ACETONE	2.37E-02	7.24E-04	0.00E+00	0.00E+00	3.32E-01	5.07E-02	3.32E+00	5.07E-01
BENZENE	2.02E-02	1.86E-03	5.85E-04	5.39E-05	2.82E-01	1.30E-01	0.00E+00	0.00E+00
1,1-DICHLOROETHANE	2.11E-02	6.36E-02	0.00E+00	0.00E+00	2.96E-01	4.45E+00	2.96E+00	4.45E+01
1,1-DICHLOROETHENE	2.27E-02	1.17E-02	1.36E-02	7.05E-03	3.18E-01	8.22E-01	3.53E+01	9.13E+01
1,2-DICHLOROETHENE (TOTAL)	9.26E-01	1.27E+01	0.00E+00	0.00E+00	1.30E+01	8.90E+02	1.44E+03	9.89E+04
ETHYLBENZENE	3.66E-02	5.23E-01	0.00E+00	0.00E+00	5.12E-01	3.66E+01	5.12E+00	3.66E+02
METHYLENE CHLORIDE	2.04E-02	1.17E-03	1.53E-04	8.81E-06	2.85E-01	8.22E-02	4.75E+00	1.37E+00
TETRACHLOROETHENE	7.48E-03	9.77E-02	3.81E-04	4.98E-03	1.05E-01	6.84E+00	1.05E+01	6.84E+02
TOLUENE	2.29E-02	2.64E-02	0.00E+00	0.00E+00	3.21E-01	1.85E+00	1.60E+00	9.25E+00
1,1,1-TRCHLOROETHANE	2.45E-02	3.14E-01	0.00E+00	0.00E+00	3.42E-01	2.20E+01	3.81E+00	2.44E+02
TRICHLOROETHENE	1.22E+01	1.83E+02	0.00E+00	0.00E+00	1.71E+02	1.28E+04	0.00E+00	0.00E+00
VINYL CHLORIDE	7.03E-02	8.67E-01	1.33E-01	1.65E+00	9.84E-01	6.07E+01	0.00E+00	0.00E+00
XYLENES (TOTAL)	2.49E-01	3.68E+00	0.00E+00	0.00E+00	3.48E+00	2.58E+02	1.74E+00	1.29E+02
SVOCs								
[illegible]S(2-ETHYLHEXYL) PHTHALATE	1.96E-05	1.85E-04	2.74E-07	2.59E-06	2.74E-04	1.29E-02	1.37E-02	6.47E-01
1,2-DICHLOROBENZENE	1.35E-05	3.91E-05	0.00E+00	0.00E+00	1.89E-04	2.74E-03	2.10E-03	3.04E-02
NAPHTHALENE	2.04E-05	1.91E-04	0.00E+00	0.00E+00	2.85E-04	1.34E-02	0.00E+00	0.00E+00
ACID EXTRACTABLES								
4-CHLORO-3-METHYLPHENOL	1.64E-05	1.33E-04	0.00E+00	0.00E+00	2.30E-04	9.32E-03	0.00E+00	0.00E+00
2,4-DIMETHYLPHENOL	2.15E-05	1.89E-04	0.00E+00	0.00E+00	3.01E-04	1.32E-02	1.51E-02	6.61E-01
2-METHYLPHENOL	2.43E-05	2.55E-04	0.00E+00	0.00E+00	3.40E-04	1.79E-02	6.79E-03	3.58E-01
4-METHYLPHENOL	1.28E-04	1.84E-03	0.00E+00	0.00E+00	1.79E-03	1.29E-01	3.57E-01	2.58E+01
PHENOL	2.02E-04	3.16E-03	0.00E+00	0.00E+00	2.82E-03	2.21E-01	4.70E-03	3.69E-01
METALS								
ALUMINUM	1.41E-02	1.50E-01	0.00E+00	0.00E+00	1.98E-01	1.05E+01	0.00E+00	0.00E+00
ARSENIC	9.90E-06	7.16E-05	1.73E-05	1.25E-04	1.39E-04	5.01E-03	4.62E-01	1.67E+01
BARIUM	4.64E-04	3.24E-03	0.00E+00	0.00E+00	6.49E-03	2.27E-01	9.28E-02	3.24E+00
CALCIUM	4.11E-01	3.16E+00	0.00E+00	0.00E+00	5.75E+00	2.21E+02	0.00E+00	0.00E+00
CHROMIUM	6.24E-05	5.59E-04	0.00E+00	0.00E+00	8.74E-04	3.91E-02	0.00E+00	0.00E+00
COBALT	2.29E-05	2.00E-04	0.00E+00	0.00E+00	3.21E-04	1.40E-02	0.00E+00	0.00E+00
COPPER	5.07E-05	4.48E-04	0.00E+00	0.00E+00	7.10E-04	3.14E-02	1.92E-02	8.48E-01
IRON	2.82E-02	2.53E-01	0.00E+00	0.00E+00	3.95E-01	1.77E+01	0.00E+00	0.00E+00
LEAD	2.99E-05	3.62E-04	0.00E+00	0.00E+00	4.19E-04	2.53E-02	2.99E-01	1.81E+01
MAGNESIUM	2.37E-01	1.96E+00	0.00E+00	0.00E+00	3.32E+00	1.37E+02	0.00E+00	0.00E+00
MANGANESE	8.08E-04	7.73E-03	0.00E+00	0.00E+00	1.13E-02	5.41E-01	2.26E+00	1.08E+02
NICKEL	9.47E-05	9.56E-04	0.00E+00	0.00E+00	1.33E-03	6.69E-02	6.63E-02	3.35E+00
POTASSIUM	1.29E-02	9.38E-02	0.00E+00	0.00E+00	1.81E-01	6.57E+00	0.00E+00	0.00E+00
SODIUM	3.03E-01	2.75E+00	0.00E+00	0.00E+00	4.25E+00	1.92E+02	0.00E+00	0.00E+00
VANADIUM	2.33E-05	2.40E-04	0.00E+00	0.00E+00	3.26E-04	1.68E-02	4.66E-02	2.40E+00
[illegible]INC	3.25E-04	3.07E-03	0.00E+00	0.00E+00	4.55E-03	2.15E-01	1.52E-02	7.17E-01
	TOTAL ADDITIONAL ESTIMATED CANCER RISKS :					**HAZARD INDEX :**		
			1.48E-01	1.66E+00			1.51E+03	1.01E+05

TABLE : 24

SUMMARY TABLE

SITE : LEICA INC.
SECTOR : GROUNDWATER
LOCATION : ON-SITE
MEDIA : GROUNDWATER
EXPOSURE SCENARIO : DRINKING WATER-OLDER CHILD AND ADULT

	MEDIA CONCENTRATION		LIFETIME UPPER BOUND EXCESS CANCER RISK		HAZARD QUOTIENT CDI/RfD	
PARAMETER	MEAN (mg/L)	RME (mg/L)	MEAN	RME	MEAN	RME
VOCs						
ACETONE	1.21E+01	7.40E-02	0.00E+00	0.00E+00	3.32E+00	5.07E-01
BENZENE	1.03E+01	1.90E-01	5.85E-04	5.39E-05	0.00E+00	0.00E+00
1,1-DICHLOROETHANE	1.08E+01	6.50E+00	0.00E+00	0.00E+00	2.96E+00	4.45E+01
1,1-DICHLOROETHENE	1.16E+01	1.20E+00	1.36E-02	7.05E-03	3.53E+01	9.13E+01
1,2-DICHLOROETHENE (TOTAL)	4.73E+02	1.30E+03	0.00E+00	0.00E+00	1.44E+03	9.89E+04
ETHYLBENZENE	1.87E+01	5.34E+01	0.00E+00	0.00E+00	5.12E+00	3.66E+02
METHYLENE CHLORIDE	1.04E+01	1.20E-01	1.53E-04	8.81E-06	4.75E+00	1.37E+00
TETRACHLOROETHENE	3.82E+00	9.98E+00	3.81E-04	4.98E-03	1.05E+01	6.84E+02
TOLUENE	1.17E+01	2.70E+00	0.00E+00	0.00E+00	1.60E+00	9.25E+00
1,1,1-TRCHLOROETHANE	1.25E+01	3.21E+01	0.00E+00	0.00E+00	3.81E+00	2.44E+02
TRICHLOROETHENE	6.25E+03	1.87E+04	0.00E+00	0.00E+00	0.00E+00	0.00E+00
VINYL CHLORIDE	3.59E+01	8.86E+01	1.33E-01	1.65E+00	0.00E+00	0.00E+00
XYLENES (TOTAL)	1.27E+02	3.76E+02	0.00E+00	0.00E+00	1.74E+00	1.29E+02
SVOCs						
BIS(2-ETHYLHEXYL) PHTHALATE	1.00E-02	1.89E-02	2.74E-07	2.59E-06	1.37E-02	6.47E-01
1,2-DICHLOROBENZENE	6.90E-03	4.00E-03	0.00E+00	0.00E+00	2.10E-03	3.04E-02
NAPHTHALENE	1.04E-02	1.95E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ACID EXTRACTABLES						
4-CHLORO-3-METHYLPHENOL	8.40E-03	1.36E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2,4-DIMETHYLPHENOL	1.10E-02	1.93E-02	0.00E+00	0.00E+00	1.51E-02	6.61E-01
2-METHYLPHENOL	1.24E-02	2.61E-02	0.00E+00	0.00E+00	6.79E-03	3.58E-01
4-METHYLPHENOL	6.52E-02	1.88E-01	0.00E+00	0.00E+00	3.57E-01	2.58E+01
PHENOL	1.03E-01	3.23E-01	0.00E+00	0.00E+00	4.70E-03	3.69E-01
METALS						
ALUMINUM	7.22E+00	1.53E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ARSENIC	5.06E-03	7.32E-03	1.73E-05	1.25E-04	4.62E-01	1.67E+01
BARIUM	2.37E-01	3.31E-01	0.00E+00	0.00E+00	9.28E-02	3.24E+00
CALCIUM	2.10E+02	3.23E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHROMIUM	3.19E-02	5.71E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00
COBALT	1.17E-02	2.04E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00
COPPER	2.59E-02	4.58E-02	0.00E+00	0.00E+00	1.92E-02	8.48E-01
IRON	1.44E+01	2.59E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00
LEAD	1.53E-02	3.70E-02	0.00E+00	0.00E+00	2.99E-01	1.81E+01
MAGNESIUM	1.21E+02	2.00E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MANGANESE	4.13E-01	7.90E-01	0.00E+00	0.00E+00	2.26E+00	1.08E+02
NICKEL	4.84E-02	9.77E-02	0.00E+00	0.00E+00	6.63E-02	3.35E+00
POTASSIUM	6.61E+00	9.59E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SODIUM	1.55E+02	2.81E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00
VANADIUM	1.19E-02	2.45E-02	0.00E+00	0.00E+00	4.66E-02	2.40E+00
ZINC	1.66E-01	3.14E-01	0.00E+00	0.00E+00	1.52E-02	7.17E-01
TOTAL ADDITIONAL ESTIMATED CANCER RISKS HAZARD INDEX :			1.48E-01	1.66E+00	1.51E+03	1.01E+05

TABLE : 25

EXPOSURE SCENARIO FORMULA AND ASSUMPTIONS

RESIDENTIAL EXPOSURE SCENARIO : DRINKING WATER
INGESTION OF CHEMICALS IN DRINKING WATER

EQUATION : $$\text{INTAKE (mg/kg-day)} = \frac{CW \times IR \times EF \times ED}{BW \times AT}$$

where :

CW = Chemical Concentration in Water (mg/liter)
IR = Ingestion Rate (liters/day)
EF = Exposure Frequency (days/year)
ED = Exposure Duration (years)
BW = Body Weight (kg)
AT = Averaging Time (period over which exposure is averaged)

VARIABLE	MEAN	RME	REFERENCE
CW (mg/liter)	MEAN	95% UCL	
IR child (L)	1	1	RAGS (1)
BW CHILD (kg)	16	16	RAGS (1)
EF (days/yr)	350	350	RAGS (2)
ED - carcinogen (years)	5	5	RAGS (1)
ED - non-carcinogen (years)	1	1	RAGS (1)
[illegible]T - carcinogen (years x days)	25550	25550	RAGS (1)
AT - non-carcinogen (years x days)	365	365	RAGS (1)

NOTE:

(1) USEPA RISK ASSESSMENT GUIDANCE FOR SUPERFUND (RAGS), VOLUME I, HUMAN HEALTH EVALUATION MANUAL, EPA/540/1-89/002, DECEMBER 1989.

(2) USEPA "RISK ASSESSMENT GUIDANCE FOR SUPERFUND (RAGS), VOLUME I, HUMAN HEALTH EVALUATION MANUAL, SUPPLEMENTAL GUIDANCE, STANDARD EXPOSURE FACTORS", OSWER DIRECTIVE 9285.6-03, MARCH 25, 1991.

TABLE : 26

MEDIA CONCENTRATIONS/CONSTANTS

SITE : LEICA INC.
SECTOR : GROUNDWATER
LOCATION : PERIMETER WELLS
MEDIA : GROUNDWATER
EXPOSURE SCENARIO : DRINKING WATER-CHILD

	MEDIA CONCENTRATION			
PARAMETER	MEAN mg/L	RME mg/L	ORAL CSF 1/(mg/kg/d)	ORAL RfD mg/kg/d
VOCs				
ACETONE	4.50E-03	3.00E-03	NA	1.00E-01
1,2-DICHLOROETHENE (TOTAL)	4.25E-03	4.00E-03	NA	9.00E-03
TRICHLOROETHENE	1.50E-02	4.20E-02	NA	NA
SVOCs				
BIS(2-ETHYLHEXYL) PHTHALATE	2.15E-02	4.00E-02	1.40E-02	2.00E-02
METALS				
ALUMINUM	4.77E+00	8.81E+00	NA	NA
ARSENIC	3.60E-03	3.60E-03	1.75E+00	3.00E-04
BARIUM	1.77E-01	2.96E-01	NA	7.00E-02
CALCIUM	1.42E+02	1.79E+02	NA	NA
CHROMIUM	1.12E-02	1.35E-02	NA	NA
COBALT	1.80E-02	3.22E-02	NA	NA
IRON	1.11E+01	1.38E+01	NA	NA
LEAD	7.38E-03	1.34E-02	NA	1.40E-03
MAGNESIUM	9.27E+01	1.47E+02	NA	NA
MANGANESE	2.53E-01	4.14E-01	NA	5.00E-03
NICKEL	7.25E-03	7.40E-03	NA	2.00E-02
POTASSIUM	7.12E+00	1.05E+01	NA	NA
SODIUM	3.22E+01	5.27E+01	NA	NA
VANADIUM	4.00E-03	6.70E-03	NA	7.00E-03
ZINC	3.90E-02	6.68E-02	NA	3.00E-01

TABLE : 27

EXPOSURE, RISK AND HAZARD CALCULATIONS

SITE : LEICA INC.
SECTOR : GROUNDWATER
LOCATION : PERIMETER WELLS
MEDIA : GROUNDWATER
EXPOSURE SCENARIO : DRINKING WATER-CHILD

	LIFETIME AVERAGE DAILY INTAKE (mg/kg/day)		LIFETIME UPPER BOUND EXCESS CANCER RISK		ANNUAL AVERAGE DAILY INTAKE (mg/kg/day)		HAZARD QUOTIENT CDI/RfD	
PARAMETER	MEAN	RME	MEAN	RME	MEAN	RME	MEAN	RME
VOCs								
ACETONE	1.93E-05	1.28E-05	0.00E+00	0.00E+00	2.70E-04	8.99E-04	2.70E-03	8.99E-03
1,2-DICHLOROETHENE (TOTAL)	1.82E-05	1.71E-05	0.00E+00	0.00E+00	2.55E-04	1.20E-03	2.83E-02	1.33E-01
TRICHLOROETHENE	6.42E-05	1.80E-04	0.00E+00	0.00E+00	8.99E-04	1.26E-02	0.00E+00	0.00E+00
SVOCs								
BIS(2-ETHYLHEXYL) PHTHALATE	9.20E-05	1.71E-04	1.29E-06	2.40E-06	1.29E-03	1.20E-02	6.44E-02	5.99E-01
METALS								
ALUMINUM	2.04E-02	3.77E-02	0.00E+00	0.00E+00	2.86E-01	2.64E+00	0.00E+00	0.00E+00
ARSENIC	1.54E-05	1.54E-05	2.70E-05	2.70E-05	2.16E-04	1.08E-03	7.19E-01	3.60E+00
BARIUM	7.58E-04	1.27E-03	0.00E+00	0.00E+00	1.06E-02	8.87E-02	1.52E-01	1.27E+00
CALCIUM	6.08E-01	7.66E-01	0.00E+00	0.00E+00	8.51E+00	5.36E+01	0.00E+00	0.00E+00
CHROMIUM	4.79E-05	5.78E-05	0.00E+00	0.00E+00	6.71E-04	4.05E-03	0.00E+00	0.00E+00
COBALT	7.71E-05	1.38E-04	0.00E+00	0.00E+00	1.08E-03	9.65E-03	0.00E+00	0.00E+00
IRON	4.75E-02	5.91E-02	0.00E+00	0.00E+00	6.65E-01	4.14E+00	0.00E+00	0.00E+00
LEAD	3.16E-05	5.74E-05	0.00E+00	0.00E+00	4.42E-04	4.02E-03	3.16E-01	2.87E+00
MAGNESIUM	3.97E-01	6.29E-01	0.00E+00	0.00E+00	5.56E+00	4.40E+01	0.00E+00	0.00E+00
MANGANESE	1.08E-03	1.77E-03	0.00E+00	0.00E+00	1.52E-02	1.24E-01	3.03E+00	2.48E+01
NICKEL	3.10E-05	3.17E-05	0.00E+00	0.00E+00	4.35E-04	2.22E-03	2.17E-02	1.11E-01
POTASSIUM	3.05E-02	4.49E-02	0.00E+00	0.00E+00	4.27E-01	3.15E+00	0.00E+00	0.00E+00
SODIUM	1.38E-01	2.26E-01	0.00E+00	0.00E+00	1.93E+00	1.58E+01	0.00E+00	0.00E+00
VANADIUM	1.71E-05	2.87E-05	0.00E+00	0.00E+00	2.40E-04	2.01E-03	3.42E-02	2.87E-01
ZINC	1.67E-04	2.86E-04	0.00E+00	0.00E+00	2.34E-03	2.00E-02	7.79E-03	6.67E-02
	TOTAL ADDITIONAL ESTIMATED CANCER RISKS :					**HAZARD INDEX :**		
			2.83E-05	2.94E-05			4.38E+00	3.37E+01

TABLE : 28

SUMMARY TABLE

SITE : LEICA INC.
SECTOR : GROUNDWATER
LOCATION : PERIMETER WELLS
MEDIA : GROUNDWATER
EXPOSURE SCENARIO : DRINKING WATER-CHILD

PARAMETER	MEDIA CONCENTRATION MEAN (mg/L)	RME (mg/L)	LIFETIME UPPER BOUND EXCESS CANCER RISK MEAN	RME	HAZARD QUOTIENT CDI/RfD MEAN	RME
VOCs						
ACETONE	4.50E-03	3.00E-03	0.00E+00	0.00E+00	2.70E-03	8.99E-03
1,2-DICHLOROETHENE (TOTAL)	4.25E-03	4.00E-03	0.00E+00	0.00E+00	2.83E-02	1.33E-01
TRICHLOROETHENE	1.50E-02	4.20E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SVOCs						
BIS(2-ETHYLHEXYL) PHTHALATE	2.15E-02	4.00E-02	1.29E-06	2.40E-06	6.44E-02	5.99E-01
METALS						
ALUMINUM	4.77E+00	8.81E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ARSENIC	3.60E-03	3.60E-03	2.70E-05	2.70E-05	7.19E-01	3.60E+00
BARIUM	1.77E-01	2.96E-01	0.00E+00	0.00E+00	1.52E-01	1.27E+00
CALCIUM	1.42E+02	1.79E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHROMIUM	1.12E-02	1.35E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00
COBALT	1.80E-02	3.22E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00
IRON	1.11E+01	1.38E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00
LEAD	7.38E-03	1.34E-02	0.00E+00	0.00E+00	3.16E-01	2.87E+00
MAGNESIUM	9.27E+01	1.47E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MANGANESE	2.53E-01	4.14E-01	0.00E+00	0.00E+00	3.03E+00	2.48E+01
NICKEL	7.25E-03	7.40E-03	0.00E+00	0.00E+00	2.17E-02	1.11E-01
POTASSIUM	7.12E+00	1.05E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SODIUM	3.22E+01	5.27E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00
VANADIUM	4.00E-03	6.70E-03	0.00E+00	0.00E+00	3.42E-02	2.87E-01
ZINC	3.90E-02	6.68E-02	0.00E+00	0.00E+00	7.79E-03	6.67E-02
	TOTAL ADDITIONAL ESTIMATED CANCER RISKS HAZARD INDEX :					
			2.83E-05	2.94E-05	4.38E+00	3.37E+01

TABLE : 29

EXPOSURE SCENARIO FORMULA AND ASSUMPTIONS

RESIDENTIAL EXPOSURE SCENARIO : DRINKING WATER
INGESTION OF CHEMICALS IN DRINKING WATER

EQUATION : INTAKE (mg/kg-day) = $\frac{CW \times IR \times EF \times ED}{BW \times AT}$

where :

CW = Chemical Concentration in Water (mg/liter)
IR = Ingestion Rate (liters/day)
EF = Exposure Frequency (days/year)
ED = Exposure Duration (years)
BW = Body Weight (kg)
AT = Averaging Time (period over which exposure is averaged)

VARIABLE	MEAN	RME	REFERENCE
CW (mg/liter)	MEAN	95% UCL	
IR ADULT (L)	2	2	RAGS (1)
BW ADULT (kg)	70	70	RAGS (1)
EF (days/yr)	350	350	RAGS (2)
ED - carcinogen (years)	5	25	RAGS (1)
ED - non-carcinogen (years)	1	1	RAGS (1)
[illegible]T - carcinogen (years x days)	25550	25550	RAGS (1)
AT - non-carcinogen (years x days)	365	365	RAGS (1)

NOTE:
(1) USEPA RISK ASSESSMENT GUIDANCE FOR SUPERFUND (RAGS), VOLUME I, HUMAN HEALTH EVALUATION MANUAL, EPA/540/1-89/002, DECEMBER 1989.
(2) USEPA "RISK ASSESSMENT GUIDANCE FOR SUPERFUND (RAGS), VOLUME I, HUMAN HEALTH EVALUATION MANUAL, SUPPLEMENTAL GUIDANCE, STANDARD EXPOSURE FACTORS", OSWER DIRECTIVE 9285.6-03, MARCH 25, 1991.

TABLE : 30

MEDIA CONCENTRATIONS/CONSTANTS

SITE : LEICA INC.
SECTOR : GROUNDWATER
LOCATION : PERIMETER WELLS
MEDIA : GROUNDWATER
EXPOSURE SCENARIO : DRINKING WATER-OLDER CHILD AND ADULT

	MEDIA CONCENTRATION			
PARAMETER	MEAN mg/L	RME mg/L	ORAL CSF 1/(mg/kg/d)	ORAL RfD mg/kg/d
VOCs				
ACETONE	4.50E-03	3.00E-03	NA	1.00E-01
1,2-DICHLOROETHENE (TOTAL)	4.25E-03	4.00E-03	NA	9.00E-03
TRICHLOROETHENE	1.50E-02	4.20E-02	NA	NA
SVOCs				
BIS(2-ETHYLHEXYL) PHTHALATE	2.15E-02	4.00E-02	1.40E-02	2.00E-02
METALS				
ALUMINUM	4.77E+00	8.81E+00	NA	NA
ARSENIC	3.60E-03	3.60E-03	1.75E+00	3.00E-04
BARIUM	1.77E-01	2.96E-01	NA	7.00E-02
CALCIUM	1.42E+02	1.79E+02	NA	NA
CHROMIUM	1.12E-02	1.35E-02	NA	NA
COBALT	1.80E-02	3.22E-02	NA	NA
IRON	1.11E+01	1.38E+01	NA	NA
LEAD	7.38E-03	1.34E-02	NA	1.40E-03
MAGNESIUM	9.27E+01	1.47E+02	NA	NA
MANGANESE	2.53E-01	4.14E-01	NA	5.00E-03
NICKEL	7.25E-03	7.40E-03	NA	2.00E-02
POTASSIUM	7.12E+00	1.05E+01	NA	NA
SODIUM	3.22E+01	5.27E+01	NA	NA
VANADIUM	4.00E-03	6.70E-03	NA	7.00E-03
ZINC	3.90E-02	6.68E-02	NA	3.00E-01

TABLE : 31

EXPOSURE, RISK AND HAZARD CALCULATIONS

SITE : LEICA INC.
SECTOR : GROUNDWATER
LOCATION : PERIMETER WELLS
MEDIA : GROUNDWATER
EXPOSURE SCENARIO : DRINKING WATER-OLDER CHILD AND ADULT

PARAMETER	LIFETIME AVERAGE DAILY INTAKE (mg/kg/day)		LIFETIME UPPER BOUND EXCESS CANCER RISK		ANNUAL AVERAGE DAILY INTAKE (mg/kg/day)		HAZARD QUOTIENT CDI/RfD	
	MEAN	RME	MEAN	RME	MEAN	RME	MEAN	RME
VOCs								
ACETONE	8.81E-06	2.94E-05	0.00E+00	0.00E+00	1.23E-04	2.05E-03	1.23E-03	2.05E-02
1,2-DICHLOROETHENE (TOTAL)	8.32E-06	3.91E-05	0.00E+00	0.00E+00	1.16E-04	2.74E-03	1.29E-02	3.04E-01
TRICHLOROETHENE	2.94E-05	4.11E-04	0.00E+00	0.00E+00	4.11E-04	2.88E-02	0.00E+00	0.00E+00
SVOCs								
BIS(2-ETHYLHEXYL) PHTHALATE	4.21E-05	3.91E-04	5.89E-07	5.48E-06	5.89E-04	2.74E-02	2.95E-02	1.37E+00
METALS								
ALUMINUM	7.05E-06	3.52E-05	0.00E+00	0.00E+00	9.86E-05	2.47E-03	0.00E+00	0.00E+00
ARSENIC	3.46E-04	2.90E-03	6.06E-04	5.07E-03	4.85E-03	2.03E-01	1.62E+01	6.76E+02
BARIUM	2.78E-01	1.75E+00	0.00E+00	0.00E+00	3.89E+00	1.23E+02	5.56E+01	1.75E+03
CALCIUM	2.19E-05	1.32E-04	0.00E+00	0.00E+00	3.07E-04	9.25E-03	0.00E+00	0.00E+00
CHROMIUM	3.52E-05	3.15E-04	0.00E+00	0.00E+00	4.93E-04	2.21E-02	0.00E+00	0.00E+00
COBALT	2.17E-02	1.35E-01	0.00E+00	0.00E+00	3.04E-01	9.45E+00	0.00E+00	0.00E+00
IRON	1.44E-05	1.31E-04	0.00E+00	0.00E+00	2.02E-04	9.18E-03	0.00E+00	0.00E+00
LEAD	1.81E-01	1.44E+00	0.00E+00	0.00E+00	2.54E+00	1.01E+02	1.81E+03	7.19E+04
MAGNESIUM	4.95E-04	4.05E-03	0.00E+00	0.00E+00	6.93E-03	2.84E-01	0.00E+00	0.00E+00
MANGANESE	1.42E-05	7.24E-05	0.00E+00	0.00E+00	1.99E-04	5.07E-03	3.97E-02	1.01E+00
NICKEL	1.39E-02	1.03E-01	0.00E+00	0.00E+00	1.95E-01	7.19E+00	9.75E+00	3.60E+02
POTASSIUM	6.30E-02	5.16E-01	0.00E+00	0.00E+00	8.82E-01	3.61E+01	0.00E+00	0.00E+00
SODIUM	7.83E-06	6.56E-05	0.00E+00	0.00E+00	1.10E-04	4.59E-03	0.00E+00	0.00E+00
VANADIUM	7.63E-05	6.54E-04	0.00E+00	0.00E+00	1.07E-03	4.58E-02	1.53E-01	6.54E+00
ZINC	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	TOTAL ADDITIONAL ESTIMATED CANCER RISKS :					**HAZARD INDEX :**		
			6.07E-04	5.07E-03			1.90E+03	7.47E+04

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SUMMARY TABLE

SITE : LEICA INC.
SECTOR : GROUNDWATER
LOCATION : PERIMETER WELLS
MEDIA : GROUNDWATER
EXPOSURE SCENARIO : DRINKING WATER-OLDER CHILD AND ADULT

	MEDIA CONCENTRATION		LIFETIME UPPER BOUND EXCESS CANCER RISK		HAZARD QUOTIENT CDI/RfD	
PARAMETER	MEAN (mg/L)	RME (mg/L)	MEAN	RME	MEAN	RME
VOCs						
ACETONE	4.50E-03	3.00E-03	0.00E+00	0.00E+00	1.23E-03	2.05E-02
1,2-DICHLOROETHENE (TOTAL)	4.25E-03	4.00E-03	0.00E+00	0.00E+00	1.29E-02	3.04E-01
TRICHLOROETHENE	1.50E-02	4.20E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SVOCs						
BIS(2-ETHYLHEXYL) PHTHALATE	2.15E-02	4.00E-02	5.89E-07	5.48E-06	2.95E-02	1.37E+00
METALS						
ALUMINUM	4.77E+00	8.81E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ARSENIC	3.60E-03	3.60E-03	6.06E-04	5.07E-03	1.62E+01	6.76E+02
BARIUM	1.77E-01	2.96E-01	0.00E+00	0.00E+00	5.56E+01	1.75E+03
CALCIUM	1.42E+02	1.79E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHROMIUM	1.12E-02	1.35E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00
COBALT	1.80E-02	3.22E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00
IRON	1.11E+01	1.38E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00
LEAD	7.38E-03	1.34E-02	0.00E+00	0.00E+00	1.81E+03	7.19E+04
MAGNESIUM	9.27E+01	1.47E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MANGANESE	2.53E-01	4.14E-01	0.00E+00	0.00E+00	3.97E-02	1.01E+00
NICKEL	7.25E-03	7.40E-03	0.00E+00	0.00E+00	9.75E+00	3.60E+02
POTASSIUM	7.12E+00	1.05E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SODIUM	3.22E+01	5.27E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00
VANADIUM	4.00E-03	6.70E-03	0.00E+00	0.00E+00	1.53E-01	6.54E+00
ZINC	3.90E-02	6.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	TOTAL ADDITIONAL ESTIMATED CANCER RISKS HAZARD INDEX :					
			6.07E-04	5.07E-03	1.90E+03	7.47E+04

H

APPENDIX H

TOXICITY SUMMARIES

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1.0 VOLATILE ORGANIC COMPOUNDS

1.1 ACETONE

General Properties

Atomic Weight: 58.08 g/mol
Melting Point: -95.35°C
Boiling Point: 56.2°C
Specific Density: 0.79 (@ 20°C)
Water Solubility: miscible
Vapour Pressure: 180 mm Hg (@ 20°C)
Henry's Law Constant: 3.97×10^{-5} atm-m^3/mol (@ 25°C)
Reference: Montgomery and Welkom, 1990.

Uses

Acetone is used in the manufacture of methacrylates, as a solvent, and as a chemical intermediate in the manufacture of methyl isobutyl ketone and other chemicals (Howard, 1990).

Sources

Natural: Acetone has been identified in vegetation, insects and mammals as a naturally occurring, volatile metabolite. It is also emitted from volcanoes and forest fires (Howard, 1990).

Anthropogenic: Acetone is produced in large quantities and may be released as stack emissions, fugitive emissions, and in wastewater in its production and use as a chemical intermediate and solvent. It is a byproduct in the manufacturing of acetaldehyde, acetic acid and wood pulping. Acetone is also emitted from wood-burning fireplaces and tobacco smoke (Howard, 1990).

Environmental Concentrations

The levels of acetone in ambient air and water are generally low. The concentration of acetone in the atmosphere in remote areas is <1 ppb. In the atmosphere of rural areas, the mean concentration is >3 ppb. Urban air in the United States has a mean acetone concentration of 6.9 ppb (ATSDR, 1993).

Acetone has been detected as a volatile component of several fruits and vegetables (ATSDR, 1993), baked potatoes, roasted filberts, dried beans and legumes, and French cognac (Howard, 1990).

Acetone doesn't bioconcentrate in aquatic organisms, and there is no data on acetone biomagnification in aquatic and terrestrial food chains (ATSDR, 1993).

Environmental Fate

Terrestrial: Due to its miscibility with water, acetone does not adsorb appreciably to soil. Also, since acetone has a high vapour pressure and a high Henry's Law constant, it will readily volatize from the soil surface. Therefore, if released on soil, acetone will both volatize and leach into the ground (Howard, 1990).

Aquatic: Again, due to acetone's high vapour pressure and high Henry's Law constant, it will be lost from this medium due to volatization. Adsorption to sediments shouldn't be significant (Howard, 1990).

Atmospheric: Acetone will be lost by photolysis and by reaction with photochemically-produced hydroxyl radicals. Loss by these two processes results in an annual average half-life of 22 days for acetone. Due to its miscibility with water, acetone is also washed out of the atmosphere by rain. This is an important removal process (Howard, 1990).

Absorption, Metabolism and Excretion

Acetone is rapidly and passively absorbed from the lungs and gastrointestinal tract. It can also be absorbed from the skin. After uptake by the lungs, acetone is readily absorbed into the blood stream (ATSDR, 1993).

Due to its high water solubility, acetone is widely distributed to tissues and organs throughout the body, especially to tissues with high water content (ATSDR, 1993).

Metabolism takes place primarily in the liver. The metabolic fate of acetone is independent of route of exposure and involves three separate gluconeogenic pathways. Ultimately carbon atoms are incorporated into glucose and other products of intermediary metabolism, with the production of CO_2 and ATP (ATSDR, 1993).

Excretion of acetone is mainly via the lungs with little excreted in the urine, regardless of the route of exposure. It is excreted both unchanged and, following metabolism, mainly as CO_2 (ATSDR, 1993).

Toxicity

Occupational exposure to acetone will be via dermal contact with solvents containing the chemical and via inhalation of the vapour. The general population is exposed to acetone in the atmosphere from sources such as auto exhaust, solvents, tobacco smoke, and fireplaces, as well as from dermal contact with consumer products containing acetone as a solvent. In addition, there will be exposure via ingestion of food items that naturally contain acetone. The average daily intake via air (assuming an air concentration of 0.05 to 20 ppb) is 24 to 960 mg/person/day (Howard, 1990).

Acetone doesn't appear to produce respiratory effects in humans or animals after oral or dermal exposure. As is common with solvent exposure, the respiratory effects of acetone observed in humans exposed by inhalation are related to the irritating properties of acetone. It is unlikely that people would experience respiratory irritation after exposure to acetone at ambient air, soil, or water levels, or at levels present at hazardous waste sites (ATSDR, 1993).

Acute inhalation of acetone exceeding concentrations of 900 ppm causes lung and throat irritation, as well as dizziness, headache and unsteadiness in workers. Rats exposed to acetone at concentrations of 19,000 ppm via inhalation for 2 to 8 weeks showed no adverse effects on the hepatic, renal or neurological systems. In a 6-week study with humans, no effects were found on respiratory, cardiovascular, hematological, hepatic and renal systems at concentrations < 1,250 ppm. Chronic inhalation of acetone at concentrations greater than 1,006 ppm can again result in lung and throat irritation, headache and lightheadedness in workers (ATSDR, 1993).

Regulatory Levels

Chronic RfD: oral - 0.1 mg/kg-day (IRIS, April, 1994).
inhalation - 3 mg/kg-day (SPHEM, 1986).
TLV-TWA: 750 ppm or 1,780 mg/m^3 (ACGIH, 1993-94).
EPA Carcinogen Classification: Group D (not classified as a human carcinogen) (IRIS, April, 1994).

1.2 BENZENE

General Properties

Atomic Weight: 78.11 g/mol
Melting Point: 5.533°C
Boiling Point: 80.1°C
Specific Density: 0.8765 (@ 20°C)
Water Solubility: 1780 mg/L (@ 25°C)
Vapour Pressure: 76 mm Hg (@ 20°C)
Henry's Law Constant: 5.48×10^{-3} atm-m^3/mol (@ 25°C)
Reference: Montgomery and Welkom, 1990.

Uses

Benzene recovered from petroleum and coal sources is used primarily as an intermediate in the manufacture of other chemicals and end products. The major uses of benzene are in the production of ethylbenzene, cumene, and cyclohexane. Benzene is especially important for unleaded gasoline because of its anti-knock characteristics. The percentage by volume of benzene in unleaded gasoline is approximately 1 to 2%. In the past, benzene was widely used as a solvent, but this is decreasing. Less than 2% of the amount produced is used as a solvent in such products as trade and industrial paints, rubber cements, adhesives, paint removers, artificial leather, and rubber goods (ATSDR, 1992).

Sources

Natural: Natural sources of benzene include volcanic eruptions, crude oil seeps, forest fires, and plant volatiles (Howard, 1990).

Anthropogenic: Benzene enters the environment from production, storage, transport, venting, and combustion of gasoline, and from production, storage, and transport of benzene itself. Other sources result from its use as an intermediate in the production of other chemicals, and as a solvent; from spills, including oil spills; from its indirect production in coke ovens; from nonferrous metal manufacture, ore mining, wood processing, coal mining and textile manufacture; and from cigarette smoke (Howard, 1990).

Environmental Concentrations

Benzene is ubiquitous in the atmosphere. It has been identified in outdoor air samples of both rural and urban environments and in indoor air. The following daily median benzene air concentrations were reported by the Volatile Organic Compound National Ambient Database (1975-85): remote (0.16 ppb), rural (0.47 ppb), suburban (1.8 ppb), urban (1.8 ppb), indoor air (1.8 ppb), and workplace air (2.1 ppb) (ATSDR, 1992).

Benzene was detected in 15% of the surface water samples collected at 1271 observation stations at a median concentration of 5 ppb. Benzene levels in water in the vicinity of five industrial facilities using or producing benzene ranged from < 1 ppb to a high of 179 ppb (ATSDR, 1992).

Benzene levels ranging from < 2 to 191 ppb were recorded in the vicinity of five industrial facilities using or producing benzene. Benzene was detected in sediment samples taken at 9% of 355 observation stations with a median level of < 5 ppb (ATSDR, 1992).

Environmental Fate

Terrestrial: If benzene is released to soil, it will be subject to rapid volatization near the surface, and that which doesn't evaporate will be highly to very highly mobile in soil and may leach to the environment (Howard, 1990). Factors influencing benzene's leaching potential include the soil type (e.g., sand versus soil), the amount of rainfall, the depth of the groundwater, and the extent of degradation. Benzene is biodegraded in soil under aerobic conditions (ATSDR, 1992).

Aquatic: When benzene is released to water, it will be subject to rapid volatization. It has been estimated that the volatization half-life for benzene is 4.81 hours for a 1-metre-deep body of water at 25°C. It is not expected to significantly adsorb to sediment, bioconcentrate in aquatic organisms, or hydrolyze (Howard, 1990). Benzene is biodegradable in surface water and groundwater. Microbial degradation in aquatic environments is influenced by the microbial population, dissolved oxygen, nutrients, other sources of carbon, inhibitors, temperature, and pH (ATSDR, 1992).

Atmospheric: When released to the atmosphere, benzene will exist predominantly in the vapour phase. Gas-phase benzene will not be subject to direct photolysis but will react with photochemically produced hydroxyl radicals. The reaction time in polluted atmospheres that contain nitrogen oxides or sulphur dioxide is accelerated. Benzene is quite water soluble and is removed from the atmosphere in rain (Howard, 1990).

Absorption, Metabolism and Excretion

Existing evidence indicates that benzene is rapidly absorbed by humans following inhalation exposure. Case studies of accidental or intentional poisoning indicates that benzene is absorbed by the oral route. Benzene can be absorbed dermally, but absorption by this route is not as substantial as that following inhalation or oral exposure (ATSDR, 1992).

Benzene is excreted both unchanged via the lungs and as metabolites in the urine. The rate and percentage of excretion via the lungs are dependent on exposure dose and route. Absorbed benzene is excreted via metabolism to phenol followed by urinary excretion of conjugated derivatives (sulphates and glucuronides) (ATSDR, 1992).

Toxicity

Benzene is widely distributed in the environment. The exposure scenario of most concern to the general public is low level inhalation over long periods. This is due to the fact that the general population is exposed to benzene mainly through inhalation of contaminated air, particularly in areas of heavy traffic and around gas stations, and through tobacco smoke from both active and passive smoking (ATSDR, 1992).

Generally, dermal absorption of benzene is secondary to benzene absorption through the respiratory system in the occupational environment. Benzene is an irritant to the skin and, by defatting the keratin layer, may cause erythema, vesiculation, and dry and scaly dermatities. Therefore, it is important to avoid skin contact (ATSDR, 1992).

Chronic low-level exposures have been associated with peripheral nervous system effects. Abnormalities in motor conduction velocity were noted in four out of six individuals occupationally exposed to adhesives containing benzene (ATSDR, 1992).

The most noted systemic effect resulting from intermediate and chronic benzene exposure is hematotoxicity. Human studies showed that inhalation of 210 to 650 ppm benzene for several months to 15 years resulted in pancytopenia, which is a decrease in the number of all three major types of blood cells (erythrocytes or red blood cells, thrombocytes or platelets, and leukocytes or white blood cells). Continued exposure to benzene can also result in aplastic anemia or leukemia. Aplastic anemia is a more severe effect of benzene and occurs when the bone marrow ceases to function and the stem cells never reach maturity. A causal relationship exists between benzene exposure and aplastic anemia in humans (ATSDR, 1992).

Both gastrointestinal (i.e., toxic gastritis and pyloric stenosis) and dermal effects (i.e., swelling and edema) have been reported to occur in a human who has swallowed benzene (ATSDR, 1992).

Damage to both the humoral and cellular components of the immune system has been known to occur in humans following inhalation exposure. This is manifested by decreased levels of antibodies and decreased levels of leukocytes in workers (ATSDR, 1992).

Data from both humans and animals indicate that benzene and/or its metabolites are genotoxic. Chromosomal aberrations in peripheral lymphocytes and bone marrow cells are the predominant effects seen in humans (ATSDR, 1992).

Many epidemiological and case studies correlate benzene exposure with leukemia (ATSDR, 1992). This indicates that benzene is carcinogenic.

Benzene is classified by USEPA as a known human carcinogen (Group A). The USEPA Cancer Slope Factor (CSF) for benzene, used to estimate additional lifetime cancer risk, is $2.9\text{x}10^{-2}$ $(\text{mg/kg-day})^{-1}$ via both oral and inhalation route. A final Reference Dose (RfD) is under review. All of the aforementioned toxicity values were taken from the Integrated Risk Information System (IRIS) database, April 1994.

Regulatory Levels
Chronic CSF: oral - $2.9\text{x}10^{-2}$ $(\text{mg/kg-day})^{-1}$
inhalation - $2.9\text{x}10^{-2}$ $(\text{mg/kg-day})^{-1}$
MCL: $5\text{x}10^{-3}$ mg/L
AWQC: water and fish - $6.6\text{x}10^{-4}$ mg/L
fish only - $4\text{x}10^{-2}$ mg/L
TLV-TWA: 10 ppm or 32 mg/m^3 (ACGIH, 1993-94).
EPA Carcinogen Classification: Group A (known human carcinogen)
Reference: IRIS, April 1994 (unless otherwise noted).

1.3 1,1-DICHLOROETHANE (1,1-DCA)

General Properties
Atomic Weight: 98.96 g/mol
Melting Point: -97.4°C
Boiling Point: 57.3°C
Specific Density: 1.1757 (@ 20°C)
Water Solubility: 5,500 mg/L (@ 20°C)
Vapour Pressure: 182.1 mm Hg (@ 20°C)

Henry's Law Constant: 5.87×10^{-3} atm-m^3/mol (@ 25°C)
Reference: Montgomery and Welkom, 1990.

Uses

The largest individual use of 1,1-DCA is as an intermediate in the manufacture of other products such as vinyl chloride, 1,1,1-trichloroethane, and to a lesser extent high vacuum rubber. It also has limited use as a solvent for plastics, oils, and fats, and thus is employed as both a cleaning agent and a degreaser. Other uses of 1,1-DCA include fabric spreading, varnish and finish removers, organic synthesis, ore flotation, in fire extinguishers, and as a fumigant and insecticide spray (ATSDR, 1990).

Sources

Natural: 1,1-DCA does not occur as a natural product (Howard, 1990).
Anthropogenic: The primary disposition of 1,1-DCA in the environment is related to the production, storage, consumption, transport, and disposal of 1,1-DCA used as a chemical intermediate, solvent, finish remover, and degreaser (ATSDR, 1990).

Environmental Concentrations

The tabulated atmospheric levels at urban, rural, and industrial sites across the United States report a median concentration of 55 ppt (ATSDR, 1990).

Data has been summarized from EPA's STORET database, where concentrations of 1,1-DCA in water range from undetected (<10 ppb) to 1,900 ppb. However, it was noted that monitoring results reported for 1,1-DCA in surface waters are almost always below the detection limit (generally 10 ppb). Concentrations in domestic surface waters used as drinking water sources have been reported to range from trace amounts to 4.8 ppb. As well, domestic groundwater supplies used for drinking water have reported concentrations ranging from trace amounts to 400 ppb of 1,1-DCA (ATSDR, 1990).

No information was found on the ambient concentrations of 1,1-DCA in soil, or on the current disposal of waste products containing the compound in landfills. The compound has more commonly been detected in ambient air and groundwater samples taken at hazardous waste sites, and it is expected that the lack of available soil monitoring data is at least in part due to rapid partitioning of 1,1-DCA released to soils to these other media (ATSDR, 1990).

Environmental Fate

Terrestrial: 1,1-DCA released to land surfaces in spills would rapidly volatize to the atmosphere, but 1,1-DCA remaining on soil surfaces would be available for transport into groundwater, since the compound does not sorb to soil particulates unless the organic content of the soil is high. Direct photolysis on soil surface is not expected. The rate of biodegradation of 1,1-DCA in soils is unknown (ATSDR, 1990).

Aquatic: 1,1-DCA released to surface waters in effluent streams is expected to partition rapidly to the atmosphere as a result of the high vapour pressure of the compound. Evaporation half-life depends on a number of factors. Wind speed and mixing conditions of the receiving waters are particularly important (ATSDR, 1990). Adsorption to sediment, biodegradation and hydrolysis should be insignificant by comparison (Howard, 1990).

Atmospheric: 1,1-DCA released to the atmosphere may be transported long distances before being washed out in precipitation. Increased atmospheric losses due to washout in frequent, heavy rains could occur, although much of the 1,1-DCA could be revolatized. In the atmosphere, 1,1-DCA is oxidized by reaction with hydroxyl radicals to form products such as monochloroacetyl chloride, chloroacetic acid, hydrochloric acid, and chlorine. The half-life of the compound has been estimated to be 44 days. Photolysis is not an important removal process for 1,1-DCA since it does not absorb strongly within the solar radiation region (ATSDR, 1990).

Absorption, Metabolism and Excretion

No studies were located in humans or animals regarding the absorption of inhaled or ingested 1,1-DCA or following dermal exposure to 1,1-DCA. However, its use as a gaseous anesthetic agent in humans provides evidence of its absorption. Furthermore, the volatile and lipophilic nature of 1,1-DCA favours pulmonary absorption. The total amount absorbed from the lungs will be directly proportional to the concentration in inspired air, the duration of exposure, the blood/air partition coefficient of 1,1-DCA, its solubility in tissues, and the individual's ventilation rate and cardiac output. When 700 mg [^{14}C]-1,1-DCA/kg was orally administered to rats and mice, absorption was evidenced by the presence of radiolabel in expired air and the presence of radiolabeled metabolites in urine, though there was no quantitative assessment made of the extent or rate of absorption (ATSDR, 1990).

The metabolism of 1,1-DCA has not been extensively characterized. Large portions of orally administered 1,1-DCA are excreted unchanged by mice and rats in the expired air. The compound not excreted unchanged in the expired air was probably largely metabolized in the liver, followed by subsequent redistribution of labeled metabolites to other organs prior to their excretion (ATSDR, 1990).

One study was located in animals regarding the extent or rate of 1,1-DCA excretion. They reported that 59% of the 1,1-DCA inhaled was metabolized and excreted in the urine and 41% was excreted in expired air. A study conducted indicated that more than 90% of an oral dose in rats (700 mg/kg) and mice (1,800 mg/kg) was excreted unchanged or as carbon dioxide within 48 hours after administration. However, no blood, urine, or tissue concentrations were monitored over time to determine the elimination kinetic parameters (ATSDR, 1990).

Toxicity

No fatalities have been reported in humans following exposure to 1,1-DCA. However, death has been observed in laboratory animals following inhalation and oral exposure. No reliable LD_{50} or LC_{50} values were found but lethal doses of 1,1,-DCA have been noted to be 5 to 10 times higher than those required to produce death following exposure to 1,2-DCA or tetrachloroethane. Therefore, it is likely that 1,1-DCA can be fatal to humans, if exposure to high enough levels occurs (ATSDR, 1990).

The use of 1,1-DCA as an anesthetic was discontinued when it was discovered that it induced cardiac arrhythmias in humans by an unknown mechanism of action at anesthetic doses (approximately 105,000 mg/m^3 or 26,000 ppm) (ATSDR, 1990).

No reports of adverse renal effects in humans following exposure to 1,1-DCA were found. Nephrotoxicity has been observed in cats following subchronic inhalation exposure to 1,000 ppm 1,1-DCA for 13 weeks following 13 weeks of intermittent exposure to 500 ppm 1,1-DCA. However, rats, rabbits, and guinea pigs exposed under the same conditions failed to exhibit any toxic effects on the kidney (ATSDR, 1990).

Chlorinated aliphatics as a class are known to cause central nervous system depression following high level exposure in humans and animals (ATSDR, 1990).

There is suggestive evidence that 1,1-DCA may be carcinogenic in humans. A significant positive dose-related trend was observed for the incidence of hemangiosarcomas and mammary adenocarcinomas in female rats, hepatocellular carcinomas in male mice and endometrial stromal polyps in female mice. There is limited evidence that neither confirms or dispels the carcinogenic potential of 1,1-DCA. Thus, these results are inconclusive as to whether it poses a cancer threat for humans (ATSDR, 1990).

Regulatory Levels

Chronic RfD: oral - 0.1 mg/kg-day (HEAST, 1994).
inhalation - 0.14 mg/kg-day (HEAST, 1994).
TLV-TWA: 100 ppm or 405 mg/m^3 (ACGIH, 1993-94).
EPA Carcinogen Classification: Group C (probable human carcinogen - limited evidence in animal studies) (IRIS, April 1994).
Reference: IRIS, April, 1994 (unless otherwise stated).

1.4 1,1-DICHLOROETHENE (1,1-DCE)

General Properties

Atomic Weight: 96.94 g/mol
Melting Point: -122.1°C
Boiling Point: 37°C
Specific Density: 1.218 (@ 20°C)
Water Solubility: 400 mg/L (@ 20°C)
Vapour Pressure: 495 mm Hg (@ 20°C)
Henry's Law Constant: $2\text{x}10^{-2}$ atm-m^3/mol
Reference: Montgomery and Welkom, 1990.

Uses

Monomeric 1,1-DCE is used as an intermediate for captive organic chemical synthesis, and in the production of polyvinylidene chloride copolymers. These polymers are used extensively in many types of flexible packing materials, as flame retardant coatings for fiber and carpet backing, and in piping, coating for steel pipes, and adhesive applications. The major application of polyvinylidene chloride copolymers is the production of flexible films for food packaging (SARAN and VELON wraps) (ATSDR, 1993).

Sources

Natural: 1,1-DCE is a man-made chemical, and thus it is not present naturally in the environment (ATSDR, 1993).

Anthropogenic: The primary sources of 1,1-DCE in the environment are related to the synthesis, fabrication, and transport of 1,1-DCE and the fabrication of its polymer products. Releases to the atmosphere are the greatest source of ambient 1,1-DCE. Smaller amounts of the chemical are released to surface water and soil, primarily as a result of waste disposal (ATSDR, 1993).

Environmental Concentrations

The National Ambient Volatile Organic Compound Database reports an ambient daily average concentration for 1,1-DCE of

4.6 ppb. The ambient average daily concentration represents contributions from rural, suburban, urban, and source-dominated sites (ATSDR, 1993).

1,1-DCE concentrations >5 mg/L have been measured in raw wastewater from the metal finishing and nonferrous metals manufacturing industries. Lower concentrations (<1 mg/L) have been measured in raw wastewater from industries involving paint and ink formulation, soap and detergent manufacturing, coil coating, battery manufacturing, coal mining, and laundries (EPA, 1981). According to the STORET database maintained by the EPA, 1,1-DCE has been detected in 3.3% of 1,350 effluent samples and in 6% of 8,714 surface water samples monitored nationwide (ATSDR, 1993).

No information is available on ambient concentrations of 1,1-DCE in soil, although this chemical is often found at hazardous waste sites (ATSDR, 1993).

Environmental Fate

Terrestrial: 1,1-DCE spilled onto surface soil will tend to partition to the atmosphere, while some of the chemical may percolate into the subsurface soil. Once in the subsurface soil, 1,1-DCE will partition between soil and water. With a high water solubility and low log soil organic carbon sorption coefficient (Koc), 1,1-DCE will migrate through the soil without significant retardation by adsorption to organic carbon. Similarly, 1,1-DCE will migrate relatively freely within groundwater (ATSDR, 1993).

Aquatic: As the magnitude of the Henry's law constant for 1,1-DCE indicates, 1,1-DCE is likely to partition readily into the atmosphere from water. Therefore, 1,1-DCE is generally not found in surface water in high concentrations. Biotransformation under anaerobic conditions is believed to be the dominant transformation process for 1,1-DCE in groundwater. However, the importance of this process under aerobic conditions, such as those found in ambient surface water, has not been determined. Photolysis and hydrolysis of 1,1-DCE in natural aquatic media are not significant processes (ATSDR, 1993).

Atmospheric: Atmospheric degradation of 1,1-DCE is expected to be dominated by gas-phase oxidation with photochemically produced hydroxyl radicals. The products from this reaction are phosgene, formaldehyde, and chloroacetyl chloride. Atmospheric degradation may also occur by a gas-phase reaction with other atmospheric oxidants, namely ozone and nitrate radicals, although these processes are too slow to successfully compete with the reaction of 1,1-DCE with hydroxyl radicals. Studies on atmospheric removal processes indicate that once in the atmosphere, 1,1-DCE is unlikely to be removed by physical processes such as wet deposition (e.g. rain) or by adsorption to atmospheric particulates (ATSDR, 1993).

Absorption, Metabolism and Excretion

Data regarding toxicokinetics of 1,1-DCE in humans are not available. Studies in animals indicate that 1,1-DCE is readily absorbed and rapidly distributed in the body following inhalation and oral exposure (ATSDR, 1993).

The oral absorption rate depends on the type of vehicle used. Oily vehicles facilitate uptake. Uptake of 1,1-DCE vapours is duration and dose-dependent. However, the percentage of 1,1-DCE uptake decreases as the exposure concentration increases, until equilibrium is reached. 1,1-DCE distributes mainly to the liver and kidney and does not appear to be stored or accumulated in the tissues (ATSDR, 1993).

1,1-DCE is metabolized by the hepatic microsomal cytochrome P-450 system. This process gives rise to several possible reactive intermediates thought to be responsible for 1,1-DCE toxicity (ATSDR, 1993).

Excretion of metabolites and parent compound occurs primarily via the urine and exhaled air. At high doses or exposures, greater percentages of the dose are exhaled as unchanged 1,1-DCE (ATSDR, 1993).

The physical/chemical properties of 1,1-DCE indicate that absorption of the liquid form of 1,1-DCE via dermal exposure is possible in humans. Information on the disposition and metabolism of 1,1-DCE following long-term exposures were not available (ATSDR, 1993).

Toxicity

Exposure to 1,1-DCE by the general population would likely occur by inhalation and oral consumption of affected food and water, while occupational exposures could occur by inhalation and dermal routes. Available information indicates that short-term exposure to acute levels of 1,1-DCE can cause adverse neurological effects, and severe liver and kidney toxicity after repeated, low-level exposure in humans (ATSDR, 1993).

Though no deaths have been reported in humans following 1,1-DCE exposure, 1,1-DCE was lethal to animals following acute exposures to high levels via the inhalation or oral routes. 1,1-DCE-induced lethality appeared to be influenced by the nutritional status of the animal regardless of exposure route. Males appeared to be affected to a greater extent by fasting than females. Experimental evidence suggests that this enhanced toxicity in fasted animals resulted from increased levels of the reactive intermediate of 1,1-DCE available for binding to macromolecules in target tissues after fasting (ATSDR, 1993).

Irritation of the mucous membrane of the upper respiratory tract and pulmonary congestion, hyperemia, and morphological changes were seen at necropsy in rats and mice acutely exposed to high levels (500 to 15,000 ppm) via inhalation. Longer-term inhalation exposure to 1,1-DCE was associated with similar adverse respiratory effects. For example, nasal irritation was observed in rats exposed to 200 ppm for 4 weeks. Inflammation of the trachea was seen in rats exposed to 72 ppm of 1,1-DCE for 6 months. These effects appeared to be rather nonspecific and most likely resulted from 1,1-DCE's irritating properties. Therefore, these data suggest that any possible respiratory effects associated with inhalation exposure to 1,1-DCE (particularly acute) in humans may be a consequence of local, nonspecific irritation (ATSDR, 1993).

Hepatotoxicity has been observed in humans following repeated exposure to 1,1-DCE, presumably by the inhalation route. Results from animal studies indicate that the liver is a primary target organ for 1,1-DCE-induced toxicity. Hepatotoxicity following both inhalation and oral exposure to 1,1-DCE was manifested by biochemical changes (i.e., increases in serum enzyme markers of liver dysfunction and induction of hepatic enzymes), and mild to marked histological changes (e.g., midzonal and/or centrilobular vacuolization, swelling, degeneration and necrosis). Mice inhaling 50 ppm 1,1-DCE for 6 hours exhibited only slight centrilobular swelling, whereas continuous inhalation exposure of mice to 15 ppm 1,1-DCE for 5 days resulted in an increase in serum enzymes indicative of liver dysfunction and hepatic degeneration was seen at 60 ppm. More severe hepatotoxic effects were seen in fasted animals as compared to fed animals. Increases in liver weight have been observed in acutely exposed rats at doses of 50 mg/kg body weight and above, and severe histological evidence of liver damage was noted following the oral administration of 200 mg 1,1-DCE/kg body weight to rats (ATSDR, 1993).

Renal toxicity has been observed following both inhalation and oral exposure to 1,1-DCE in animals. Though data on kidney toxicity in humans following exposure to 1,1-DCE do not currently exist, , evidence from animal studies in two species suggest that nephrotoxicity may also result in humans, particularly following acute exposure. Following acute exposure, the range of 1,1-DCE concentrations that produced effects in rats is 50 to 300 ppm, with the severity of kidney lesions increasing with increasing dose and duration of exposure. Severe histological lesions of the kidney are often seen in mice following acute inhalation exposure to 10 to 50 ppm of 1,1-DCE. Histopathological changes were seen in rats following oral exposure of 400 mg 1,1-DCE/kg body weight. The renal effects of long-term exposure to 1,1-DCE in humans are not known (ATSDR, 1993).

Central nervous system toxicity has been observed in humans acutely exposed to high concentrations (approximately 4,000 ppm) of inhaled 1,1-DCE. Complete recovery occurred if exposure was not prolonged. Effects on the central nervous system have not been observed following oral or repeated inhalation exposures to 1,1-DCE in animals (ATSDR, 1993).

1,1-DCE has demonstrated weak teratogenic effects in laboratory animals. Developmental toxicology was enhanced following inhalation exposure to 1,1-DCE as compared to oral exposure. After inhalation exposure at 80 and 160 ppm for 7 hours/day on gestation days 6 through 18, 1,1-DCE produced maternal toxicity and increased resorption and skeletal alterations (ATSDR, 1993).

The carcinogenicity of 1,1-DCE following inhalation, oral, and dermal exposure has been evaluated in mice, rats, and hamsters. Evidence of a positive carcinogenic effect from 1,1-DCE exposure has been seen in Swiss mice exposed by inhalation to 25 ppm 1,1-DCE. There were increases in renal adenocarcinomas (ATSDR, 1993).

Regulatory Levels

Chronic RfD: oral - 0.009 mg/kg-day
Chronic CSF: oral - 0.6 $(mg/kg\text{-}day)^{-1}$
inhalation - 0.175 $(mg/kg\text{-}day)^{-1}$
MCL: 0.007 mg/L
AWQC: water and fish - 3.3×10^{-5} mg/L
fish only - 1.85×10^{-3} mg/L
TLV-TWA: 5 ppm or 20 mg/m^3 (ACGIH, 1993-94).
EPA Carcinogen Classification: Group C (probable human carcinogen - limited evidence in animal studies)
Reference: IRIS, April 1994 (unless otherwise stated).

1.5 1,2-DICHLOROETHENE

1,2-DCE is a colourless liquid with a sharp, harsh odour that is readily flammable. There are two forms of 1,2-DCE: cis-1,2-DCE and trans-1,2-DCE. 1,2-DCE is widely used as a low-temperature extraction solvent for organic materials such as dyes, perfumes, lacquers and thermoplastics. Primary use of 1,2-DCE is as an intermediate in the synthesis of other chlorinated solvents and other chemical production. It is often the by-product in the manufacture of chlorinated compounds. Direct chlorination of acetylene at about 40°C can also produce 1,2-DCE.

1,2-DCE is released to the environment from its production and use, emissions from contaminated wastewaters, waste disposal sites and from pyrolysis/combustion of polyvinyl chloride and some vinyl copolymers.

DCE is easily absorbed into the body from ingested food and water, or from inhaled air. Dermal absorption is minimal since most of the material on the skin would volatilize before absorption would occur.

The general population may be exposed to low levels (0.013-0.076 ppb) of 1,2-DCE through inhalation of affected air in urban areas. These exposure levels correspond to an average daily intake of 1-6 μg/day assuming an average daily intake of 20 m^3 of air.

Inhalation of high levels of 1,2-DCE causes nausea, drowsiness, fatigue, and death at very high levels. The health effects resulting from short- and long-term human exposure to specific levels of 1,2-DCE are unknown. Additionally, the health effects resulting from long-term exposure to low concentrations (ie. environmental levels) of 1,2-DCE are unknown.

Laboratory animals subjected to 1,2-DCE in air showed liver, lung and heart damage after short-term (200-3,000 ppm for 8 hours) and long-term exposure (200 ppm for 16 weeks); increasing severity with the length of exposure duration. Liver and lung damage were observed in animals that were fed 1,2-DCE and extremely high doses of 1,2-DCE (66,000 ppm to 433,000 ppm in food) caused death.

1,2-DCE is not classified by USEPA and has an oral RfD of 0.009 mg/kg-day (IRIS, 1993).

1.6 ETHYLBENZENE

General Properties
Atomic Weight: 106.17 g/mol
Melting Point: -95.0°C
Boiling Point: 136.2°C

Specific Density: 0.8670 (@ 20°C)
Water Solubility: 152 mg/L (@ 20°C)
Vapour Pressure: 7.08 mm Hg (@ 20°C)
Henry's Law Constant: 8.68×10^{-3} atm-m^3/mol (@ 25°C)
Reference: Montgomery and Welkom, 1990.

Uses

Ethylbenzene is used primarily in the production of styrene. Other uses of ethylbenzene include use as a solvent, as a constituent of asphalt and of naphtha, and in fuels. It is used in the manufacture of acetophenone, cellulose acetate, diethylbenzene, ethyl anthraquinone, ethylbenzene sulphonic acids, propylene oxide, and α-methylbenzyl alcohol (ATSDR, 1990).

Sources

Natural: Ethylbenzene is naturally present in crude petroleum (ATSDR, 1990).

Anthropogenic: Ethylbenzene is released to the atmosphere during manufacture and handling. Releases to the air can also occur with the use of consumer products such as pesticides, solvents, carpet glue, and varnishes. It has also been measured in cigarette smoke. Releases to water occur as a result of industrial discharges, the use of gasoline fuel for boating, fuel spillage, leaking underground storage tanks, landfill leachate, and the inappropriate disposal of waste. Ethylbenzene can be released to soils through the spilling of gasoline and other fuels, the disposal of solvents and household products such as paint, cleaning and degreasing solvents, varnishes, and pesticides, and emissions from leaking underground storage tanks (ATSDR, 1990).

Environmental Concentrations

Because ethylbenzene is a component of automotive emissions, it is widely present in urban and rural atmospheres. Median concentrations for 6 remote and 122 rural locations are reported as 0.156 and 0.013 ppb, respectively. Higher median concentrations were reported for 886 suburban (0.62 ppb) and 1,532 urban (0.62 ppb) locations (ATSDR, 1990).

The median ethylbenzene concentration in ambient surface waters in the United States in 1980 - 1982 was less than 5.0 µg/L according to EPA's STORET water quality data base. The chemical was detected in 10% of the 1,101 samples collected during that period. Ethylbenzene was detected in 7.4% of the 1,368 industrial effluent samples collected during 1980 to 83 at a median concentration of less than 3.0 µg/L. The median ethylbenzene concentration in sediment was 5.0 µg/kg, the compound was detected in 11% of 350 samples. The 1982 Ground Water Supply Survey conducted by the EPA reported ethylbenzene in only 3 out of 466 random samples at a mean concentration of 0.8 µg/L and a maximum concentration of 1.1 µg/L (ATSDR, 1990).

Ethylbenzene has been detected in soil samples collected at 25% of the 2,783 hazardous waste sites that have had samples analyzed by the CLP . The geometric mean concentration in the positive samples was 0.067 mg/kg (ATSDR, 1990).

Environmental Fate

Terrestrial: When released onto soil, part of the ethylbenzene will evaporate into the atmosphere. It has a moderate adsorption in soil but will probably leach into the groundwater, especially in soil with a low organic content. It is likely that it will biodegrade slowly after acclimation. There is evidence that ethylbenzene slowly biodegrades in groundwater. It will not hydrolyze in soil or groundwater (Howard, 1989).

Aquatic: When released into water, ethylbenzene will evaporate fairly rapidly into the atmosphere with a half-life ranging from hours to a few weeks. Biodegradation will also be rapid (half-life 2 days) after a population of degrading microorganisms becomes established, which will depend on the particular body of water and the temperature. Some ethylbenzene may be adsorbed by sediment, but significant bioconcentration in fish is not expected to occur based upon its octanol/water partition coefficient. It will not significantly photolyze or hydrolyze (Howard, 1989).

Atmospheric: If ethylbenzene is released to the atmosphere it will exist predominantly in the vapour phase based on its vapour pressure. It will be removed from the atmosphere principally by reaction with photochemically produced hydroxyl radicals (half-life 0.5 hours to 2 days). Additional quantities will be removed by rain. It will not be expected to directly photolyze (Howard, 1989).

Absorption, Metabolism and Excretion

Inhalation studies in humans demonstrate that ethylbenzene is rapidly and efficiently absorbed via this route. Human volunteers exposed for 8 hours to ethylbenzene at concentrations of 23 to 85 ppm were shown to retain 64% of the inspired vapour, with only trace amounts detected in expired air. No studies were located regarding the absorption of ethylbenzene in humans following oral exposure. Studies in animals, however, indicate that ethylbenzene is quickly and effectively absorbed by this route. 84% of the radioactivity from a single oral dose of 30 mg ethylbenzene/kg administered to rats was recovered within 48 hours. Studies in humans dermally exposed to liquid ethylbenzene demonstrate rapid absorption through the skin, but absorption of ethylbenzene vapours through the skin appears to be minimal (ATSDR, 1990).

The metabolism of ethylbenzene has been studied in humans and other mammalian species. The data demonstrate that ethylbenzene rapidly undergoes a complex series of biotransformations from which numerous metabolites have been isolated (ATSDR, 1990).

Excretion of ethylbenzene has been studied in humans and in a number of animal species. Ethylbenzene has been shown to be rapidly metabolized and then eliminated from the body, primarily as urinary metabolites (ATSDR, 1990).

Toxicity

No deaths have been reported in humans following ethylbenzene exposure, but death has occurred in laboratory animals following acute exposure to high levels of ethylbenzene administered via the inhalation, oral and dermal routes. The concentrations of ethylbenzene necessary to cause death in animals have been shown to be relatively high (1,200 to 13,367 ppm, inhalation exposure; 4,728 mg/kg/day, oral exposure;

15,415 mg ethylbenzene/kg body weight, dermal exposure). Given this information, death in humans resulting from chronic low-level exposure to ethylbenzene is unlikely (ATSDR, 1990).

Moderate upper respiratory irritation accompanied by chest constriction has been reported in humans exposed by inhalation to ethylbenzene concentrations as low as 460 ppm. Symptoms become more extreme following exposure to higher doses. Animal studies support these findings. The available data suggest that severe respiratory effects in humans could result following inhalation exposure to high doses of ethylbenzene (ATSDR, 1990).

Renal effects, manifested as enzyme changes, increases in organ weight, and tubular swelling, have been observed in rats and mice. These studies suggest that renal effects may occur in humans exposed to high doses of ethylbenzene (ATSDR, 1990).

The principal effect in humans acutely exposed to high concentrations (460 to 1,200 ppm) of ethylbenzene has been central nervous system toxicity (dizziness, vertigo). Complete recovery has been shown to occur if the exposure is not prolonged. There is considerable likelihood that human populations acutely exposed to high concentrations of ethylbenzene are unknown (ATSDR, 1990).

No association between increased cancer incidence in humans and exposure to ethylbenzene has been reported in current literature. The only chronic bioassay located showed a significant increase in tumors in rats orally exposed to ethylbenzene. These results are inconclusive, given the weakness of the study. Therefore, the relevance of ethylbenzene induced carcinogenicity to public health cannot be ascertained (ATSDR, 1990).

Regulatory Levels

Chronic RfD: oral - 0.1 mg/kg-day
inhalation - 0.286 mg/kg-day
MCL: 0.7 mg/L (USEPA, July 1992).
AWQC: water and fish - 1.4 mg/L

fish only - 3.28 mg/L

TLV-TWA: 100 ppm or 434 mg/m^3 (ACGIH, 1993-94).

EPA Carcinogen Classification: Group D (not classified - inadequate evidence in animal studies)

Reference: IRIS, April 1994 (unless otherwise indicated).

1.7 METHYLENE CHLORIDE

General Properties

Atomic Weight: 84.93 g/mol

Melting Point: -95.1°C

Boiling Point: 40°C

Specific Density: 1.3266 (@ 20°C)

Water Solubility: 20,000 mg/L (@ 20°C) (ATSDR, 1992).

Vapour Pressure: 349 mm Hg (@ 20°C) (ATSDR, 1992).

Henry's Law Constant: 2.03×10^{-3} atm-m^3/mol (ATSDR, 1992).

Reference: Weast, 1986 (unless otherwise indicated).

Uses

Methylene chloride is used as a solvent in paint strippers and removers (25%), as a propellant in aerosols (25%), as a process solvent in the manufacture of drugs, pharmaceutical and film coatings (20%), as a metal cleaning and finishing solvent (10%), in electronics manufacturing (10%), and as an agent in urethane foam blowing (10%). Aerosol products in which methylene chloride may be found include paints, automotive products, and insect sprays. However, because of labeling regulations and concerns over health and environmental issues, the use of methylene chloride in consumer aerosol products has declined (ATSDR, 1992).

Methylene chloride is also used as an extraction solvent for spice oleoresins, hops, and for the removal of caffeine from coffee. However, because of concern over residual solvent, most decaffeinators no longer use methylene chloride (ATSDR, 1992).

Sources

Natural: Methylene chloride does not appear to occur naturally in the environment (ATSDR, 1992).

Anthropogenic: Methylene chloride is released to the atmosphere during its production, storage, and transport, but most (more than 99%) of the atmospheric releases result from industrial and consumer uses. Wastewater containing methylene chloride may occur primarily from the following industries: paint and ink, aluminum forming, coal mining, photographic equipment and supplies, pharmaceutical, organic chemical/plastics, rubber processing, foundries, and laundries (Howard, 1990). The principal sources of methylene chloride releases to land are disposal of methylene chloride products and containers to landfills (ATSDR, 1992).

Environmental Concentrations

Methylene chloride has been detected in ambient air samples taken from around the world. Background levels are usually at about 50 ppt (0.17 $\mu g/m^3$). Concentrations in urban areas and in the vicinity of hazardous waste sites are generally one to two orders of magnitude higher (ATSDR, 1992).

Methylene chloride has been detected in surface water, groundwater, and finished drinking water throughout the United States. It was detected in 30% of 8,917 surface water samples recorded in the STORET database, at a median concentration of 0.1 µg/L. Since volatization is restricted in groundwater, concentrations of methylene chloride are often higher there than in surface water. Occurrence of methylene chloride in groundwater has been reported in several surveys across the United States, with concentrations ranging from 0 to 3,600 µg/L. Reported mean concentrations in drinking water are generally less than 1 µg/L (ATSDR, 1992).

Methylene chloride was detected in 20% of 338 sediment samples recorded in the STORET database, at a median concentration of 13 µg/kg (ATSDR, 1992).

Environmental Fate

Terrestrial: When spilled on land, methylene chloride is expected to evaporate from near-surface soil into the atmosphere because of its high vapour pressure. It is probable that it will leach through soil into groundwater. Hydrolysis in soil or groundwater is not an important process under normal environmental conditions (Howard, 1990).

Aquatic: Methylene chloride will be primarily lost by evaporation to the atmosphere which should take several hours, depending on wind and mixing conditions. Biodegradation is possible in natural waters but will probably be very slow compared with evaporation. Little is known about adsorption to sediment or bioconcentration in aquatic organisms but these are not likely to be significant processes. Hydrolysis is not an important process under normal environmental conditions (Howard, 1990).

Atmospheric: Methylene chloride released into the atmosphere will degrade by reaction with hydroxyl radicals with a half-life of several months. It will not be subject to direct photolysis. A small fraction of the chemical will diffuse to the stratosphere where it will rapidly degrade by photolysis and reaction with chlorine radicals. A moderately water-soluble chemical such as methylene chloride will be expected to partially return to earth in rain (Howard, 1990).

Absorption, Metabolism and Excretion

The principal route of human exposure to methylene chloride is inhalation. Evaluation of pulmonary uptake in humans indicated that 70 to 75% of inhaled methylene chloride vapour was absorbed. Once exposure ceased, methylene chloride was rapidly cleared from the blood. No studies were located regarding absorption in humans after oral exposure to methylene chloride but in animals, the limited available data suggest that methylene chloride is easily absorbed from the gastrointestinal tract, particularly if exposed via aqueous media (ATSDR, 1992).

Available data suggest that there are two pathways by which methylene chloride is metabolized. One pathway utilizes the mixed function oxidase (MFO) enzymes and produces carbon monoxide (CO). The other pathway involves the glutathione transferase (GST) and produces carbon dioxide (CO_2) (ATSDR, 1992).

Methylene chloride is removed from the body primarily in expired air and urine (ATSDR, 1992).

Toxicity

Acute inhalation exposure of humans (usually during paint stripping) has caused death. Exposure levels were not known and the biologic cause of death was not certain. However, myocardial infarction was reported in one case . Mortality risk was not increased in humans chronically exposed occupationally to 30 to 120 ppm methylene chloride (ATSDR, 1992).

No studies were located regarding respiratory effects in humans or in animals for any duration. No information was found on the respiratory effects of low levels of methylene chloride in humans near hazardous waste sites or industrial urban areas (ATSDR, 1992).

Studies in humans exposed to 75 to 475 ppm did not reveal an association between occupational exposure to methylene chloride and cardiac abnormalities. These findings suggest that the cardiovascular system is not a sensitive target for methylene chloride in humans (ATSDR, 1992).

Human data are limited on the effects of methylene chloride on the liver. However, the liver appears to be a major target organ following methylene chloride exposure in animals. Histomorphological and biochemical changes of the liver occur following acute inhalation (6 hours to 7 days) at high dose levels (5,200 ppm), while fatty changes and biochemical alterations (altered cytochrome levels) were also observed at lower concentrations (100 ppm) for continuous, 24 hour intermediate-duration exposure (100 days). Cytoplasmic vacuolization was observed in rats at 25 ppm (ATSDR, 1992).

No studies were found regarding renal effects in humans by any route of exposure. In rats, methylene chloride produced non-specific renal tubular and degenerative changes after continuous intermediate-duration exposure to methylene chloride vapours (100 to 5,000 ppm) (ATSDR, 1992).

Studies in humans and animals indicate that the central nervous system is a potentially important target for methylene chloride. For the most part, anesthetic responses were reported and effects subsided once exposure ceased. A decrease in behavioural performance and various psychomotor tasks was evident in humans acutely exposed to methylene chloride (300 ppm or greater) in experimental studies. Studies in factory workers chronically exposed to methylene chloride revealed no evidence of neurological or behavioural impairment at exposure levels of 75 to 100 ppm. There was a decrease in succinic dehydrogenase activity in the cerebellum in rats exposed to vapours of methylene chloride at concentrations of 500 ppm or greater and signs of increased protein breakdown in the cerebellum at 1,000 ppm. Based on behavioural or sensory responses which were reported in humans following acute inhalation exposure of 300 ppm or greater, it seems likely that methylene chloride produces nonspecific anesthetic effects similar to those produced by other halogenated hydrocarbons (ATSDR, 1992).

No studies were located regarding developmental effects in humans after inhalation, oral, or dermal exposure. Animal studies demonstrated that inhalation of methylene chloride vapours at concentrations of 1,250 ppm produced minor skeletal effects. Fetal weight was reduced and behavioural changes occurred in rat pups following exposure to 4,500 ppm methylene chloride. Although fetal body weights were decreased, the absence of other fetotoxic effects, including embryo lethality and major malformations, suggest that methylene chloride is not likely to cause developmental effects and behavioural changes at levels encountered at hazardous waste sites (ATSDR, 1992).

Data on reproductive toxicity in humans are limited to one case series study reporting low sperm counts in workers who inhaled vapours of methylene chloride and who had direct contact with the liquid. It is uncertain if effects were due to methylene chloride since workers may have had multiple compound exposures and the study group was small. Animal studies were negative. Therefore, methylene chloride doesn't appear to pose a hazard to human reproduction (ATSDR, 1992).

Epidemiology studies have not revealed a causal relationship between deaths due to cancer and occupational exposure to methylene chloride (475 ppm or less). Studies in animals exposed via inhalation have demonstrated that methylene chloride is probably carcinogenic. When administered by inhalation, methylene chloride (at concentrations of 2,000 ppm or greater) increased the incidence of alveolar/bronchiolar neoplasms in mice of both sexes. Concentrations of 500 ppm or greater increased the incidence of benign mammary glands tumours per animal in females and male rats (ATSDR, 1992).

Regulatory Levels

Chronic RfD: oral - 0.06 mg/kg-day
inhalation - 0.857 mg/kg-day (HEAST, 1994).
Chronic CSF: oral - 7.5x10^{-3} (mg/kg-day)$^{-1}$
inhalation - 1.65x10^{-3} (mg/kg-day)$^{-1}$
MCL: 0.005 mg/L (USEPA, May 1993).
AWQC: water and fish - 1.9x10^{-4} mg/L
fish only - 1.57x10^{-2} mg/L
TLV-TWA: 50 ppm or 174 mg/m^3 (ACGIH, 1993-94).
EPA Carcinogen Classification: Group B2 (probable human carcinogen - sufficient evidence in animal studies)
Reference: IRIS, April 1994 (unless otherwise indicated).

1.8 TETRACHLOROETHYLENE (PCE)

General Properties

Atomic Weight: 165.83 g/mol
Melting Point: -19°C
Boiling Point: 121.2°C
Specific Density: 1.6227 (@ 20°C)
Water Solubility: 150 mg/L (@20°C)
Vapour Pressure: 14 mm Hg (@ 20°C)

Henry's Law Constant: 1.53×10^{-2} atm-m^3/mol
Reference: Montgomery and Welkom, 1990.
Note: PCE as a short form comes from the synonym for tetrachloroethylene, PERCHLOROETHYLENE.

Uses

PCE is commercially important as a chlorinated hydrocarbon solvent and as a chemical intermediate. An estimate of the current end-use pattern for PCE is as follows: 50% for dry cleaning and textile processing, 28% as a chemical intermediate (for the synthesis of fluorocarbon 113, 114, 115 and 116), 9% for industrial metal cleaning, 10% for exports, and 3% for other uses (ATSDR, 1992).

Sources

Natural: PCE is not known to occur in nature (Howard, 1990).

Anthropogenic: PCE is a man-made volatile organic compound that is widely distributed in the environment. PCE is released to the environment via industrial emissions, and building and consumer products. Releases are primarily to the atmosphere, but the compound is also released to surface water and land in sewage sludges and in other liquid and solid waste (ATSDR, 1992).

Environmental Concentrations

A compilation of available U.S. ambient air monitoring data for PCE prior to 1981 has been published. This compilation, which includes more than 2,500 monitoring points, reported mean PCE concentrations of 160 ppt in rural and remote areas, 790 ppt in urban and suburban areas, and 1,300 ppt in areas near emission sources (ATSDR, 1992).

PCE has been detected in drinking water sources throughout the United States. Median concentrations of 0.3 and 3.0 ppb were found in water samples from 180 U.S. cities using surface water supplies and 36 cities using groundwater supplies, respectively. Roughly 25% of all samples were positive for PCE. Results from an EPA Groundwater Supply Survey of 945 water supplies nationwide, using groundwater sources, showed

PCE in 75 water supplies; the median concentration of the positive samples was about 0.75 ppb, with a maximum level of 69 ppb (ATSDR, 1992).

An analysis of the EPA STORET Data Base showed that PCE had been positively detected in 5% of 359 sediment observation stations, with median levels <5 ng/g (ATSDR, 1992).

Environmental Fate

Terrestrial: If PCE is released to soil, it will evaporate fairly rapidly into the atmosphere due to its high vapour pressure and low adsorption to soil. It can leach rapidly through sandy soil and therefore may reach groundwater. Biodegradation may be an important process in anaerobic soils. Slow biodegradation may occur in groundwater where acclimated populations of microorganisms exist. There is some evidence of slow degradation in subsurface soils. PCE should not hydrolyze under normal environmental conditions (Howard, 1990).

Aquatic: If PCE is released in water, the primary loss will be by evaporation. The half-life for evaporation from water will depend on wind and mixing conditions, and is estimated to range from 3 hours to 14 days in rivers, lakes, and ponds. Chemical and biological degradation are expected to be very slow. PCE will not be expected to significantly bioconcentrate in aquatic organisms or to adsorb to sediment. In a natural pond, PCE disappeared in 5 and 36 days at low (25 ppm) and high (250 ppm) dose levels, respectively (Howard, 1990).

Atmospheric: If PCE is released to the atmosphere, it will be expected to exist in the vapour phase based upon its relatively high vapour pressure. Vapour phase PCE will be expected to degrade by reaction with photochemically produced hydroxyl radicals or chlorine atoms produced by photooxidation of PCE. Estimated photooxidation time scales range from an approximate half-life of 2 months to complete degradation in an hour. Some of the PCE in the atmosphere may be subject to washout in rain based on the solubility of PCE in water; PCE has been detected in rain (Howard, 1990).

Absorption, Metabolism and Excretion

The primary route of exposure to PCE is inhalation. PCE is readily absorbed by humans through the lungs into the blood. Pulmonary uptake of PCE is proportional to ventilation rate, duration of exposure, and, at lower atmospheric concentrations of PCE, to the concentration of PCE in the inspired air. PCE was found in the blood of a 6-year-old boy who ingested 12 to 16 g of the compound, indicating that PCE is absorbed following oral administration in humans. Dermal absorption in humans following exposure to vapours of PCE is apparently not as important as absorption via inhalation. Results from studies in animals indicate that absorption via the dermal route is relatively unimportant compared to absorption following inhalation (ATSDR, 1992).

The metabolism of PCE is believed to be mediated by a cytochrome P-450 catalyzed oxidation reaction involving the formation of an epoxide intermediate. Following inhalation or ingestion of PCE in humans, the primary metabolites identified in urine and blood were trichloroacetic acid and trichloroethanol (ATSDR, 1992).

Exhalation of unmetabolized parent compound appears to be the primary route of excretion of an absorbed dose of PCE in humans, regardless of the route of exposure (ATSDR, 1992).

Toxicity

The major exposure routes to PCE by the general public are by inhalation and ingestion. Occupational exposure to PCE (i.e., dry cleaners, chemical workers) is generally by inhalation. The primary targets of toxicity include the brain, liver, and kidneys. There is some evidence that suggest reproductive effects may be induced in women exposed to PCE (ATSDR, 1992).

Exposure to high concentrations (> 1,000 ppm) of PCE vapour results in collapse, unconsciousness, and death in humans. The cause of death may be related to depression of respiratory centers of the central nervous system and possibly due to cardiac arrhythmia and heart block. Animal studies of oral exposure suggest that anesthesia and death would be likely occurrences in humans if high concentrations were swallowed. There are no reports of fatalities in humans or animals exposed solely by the dermal route (ATSDR, 1992).

Intense upper respiratory tract irritation occurred in humans exposed acutely by inhalation to high concentrations (> 1,000 ppm) of PCE. Respiratory irritation (irritation of the nasal passages) was reported in workers exposed to PCE vapors at levels of 232 ppm to 385 ppm in a degreasing operation and in volunteers exposed to concentrations as low as 216 ppm for 45 minutes to 2 hours. Volunteers exposed to concentrations as high as 1,060 ppm could tolerate no more than 1 to 2 minutes of exposure before leaving the chamber (ATSDR, 1992).

Despite the relatively large number of people occupationally exposed to PCE, there are few cases of PCE-associated cardiotoxicity. A patient experienced cardiac arrhythmia; he had been employed in a dry cleaning facility for 7 months where he treated clothes with PCE. There is no strong evidence that people exposed to environmental levels of PCE or levels at hazardous waste sites would develop cardiovascular effects (ATSDR, 1992).

PCE has been shown to cause hepatotoxic effects in humans and animals by inhalation and oral routes of exposure. The types of PCE-induced hepatic effects in humans are not well documented, and the exposures or doses producing these effects are not adequately characterized. In most cases, hepatic effects in humans have been reported as transient in nature. The liver is also a target organ in animals, with hepatic lesions induced in experimental animals by inhalation exposure to PCE. Mice appear to be the most sensitive species to this effect. Hepatocellular vacuolization occurred after a single 4-hour exposure of mice to 200 ppm or greater concentrations of PCE. This lesion was also reported in male mice exposed to 875 or 1,750 ppm PCE for 14 days and in females exposed to the highest dose. Vacuolization was not present at 425 ppm. A number of lesions reported in rats after acute exposure to PCE were relatively nonspecific (ATSDR, 1992).

Reversible kidney damage has been reported in humans accidentally exposed to acutely toxic amounts of PCE vapour. There are also data that suggest that occupational exposure to hydrocarbon solvents as a class may contribute to chronic renal disease. Subtle renal perturbations have been detected in at least one study of chronically exposed workers in dry cleaning workshops. They were exposed for an average of 14 years to an estimated time-weighted average of 10 ppm of PCE (ATSDR, 1992).

Skin damage (burns) and intense ocular irritation have been reported in humans exposed to concentrations of PCE liquid or vapours (> 1,000 ppm) high enough to cause anesthetic effects. Burning or stinging sensations in the eyes occurred after exposure to 600 or 280 ppm: very mild irritation was reported by four subjects at exposure to 216 or 106 ppm. No damage to skin has been reported in animals exposed acutely or chronically. Dermal/ocular effects are unlikely in environmentally exposed humans (ATSDR, 1992).

There is a suggestion that exposure to solvents in drinking water can produce some immunological effects. Effects of mixed solvents on the immune system are supported by a study in mice exposed to a mixture of solvents in drinking water (ATSDR, 1992).

Symptoms of acute inhalation exposure to high levels of PCE is well documented in humans and includes headaches, dizziness, and drowsiness. Neurological symptoms of dizziness and drowsiness occurred at exposure to 216 ppm for 45 minutes to 2 hours: loss of motor coordination occurred at exposure to 280 ppm for 2 hours or 600 ppm for 10 minutes. Human data suggest that the threshold for acute effects may be in the concentration range of 100 to 200 ppm with preanesthetic/anesthetic effects occurring at a threshold of 1,000 ppm. These values are supported by animal studies. There is a suggestion that long-term inhalation exposure of workers to organic solvents, including PCE, causes irreversible neurological impairment. There are no data in humans to indicate that structural brain damage is associated with PCE exposure (ATSDR, 1992).

Some epidemiological studies of dry cleaning workers suggest a possible association between chronic PCE exposure and increased cancer risk. The results of these studies are inconclusive because of the likelihood of concomitant exposure to petroleum solvents, the effects of other confounding factors, such as smoking and other life-style variables, and methodological limitations in choosing control population and maintaining complete follow-up. Occupational exposure to PCE and other solvents did not generally result in increased risk of hematopoietic neoplasms (ATSDR, 1992).

Regulatory Levels

Chronic RfD: oral - 0.01 mg/kg-day*

Chronic CSF: oral - 0.051 $(mg/kg\text{-}day)^{-1}$**

inhalation - 1.5×10^{-7} $(mg/kg\text{-}day)^{-1}$**

MCL: 0.005 mg/L ***

AWQC: water and fish - 8×10^{-4} mg/L *

fish only - 8.85×10^{-3} mg/L *

TLV-TWA: 50 ppm or 339 mg/m^3 (ACGIH, 1993-94).

EPA Carcinogen Classification: Group B2 (probable human carcinogen-sufficient evidence in animal studies) (under review).

References: * IRIS, April 1994 ** HEAST, 1994 *** USEPA, July 1992.

1.9 TOLUENE

General Properties

Atomic Weight: 92.14 g/mol

Melting Point: -95°C

Boiling Point: 110.6°C

Specific Density: 0.8669 (@ 20°C)

Water Solubility: 515 mg/L (@ 20°C)

Vapour Pressure: 22 mm Hg (@ 20°C)

Henry's Law Constant: 6.74×10^{-3} $atm\text{-}m^3/mol$ (@ 25°C)

Reference: Montgomery and Welkom, 1990.

Uses

The major use of nonisolated toluene (100%) is as a mixture added to gasoline (BTX) to improve octane ratings. Nearly half of the isolated toluene which is not back-blended into gasoline is used to produce benzene. About one-third of the isolated toluene is used as a solvent in paints, coatings, adhesives, inks, and cleaning agents. A portion of the isolated toluene goes into the production of polymers used to make nylon, plastic soda bottles, and polyurethanes. Toluene is also used as a starting material in the synthesis of trinitrotoluene (TNT). The remainder is used for pharmaceuticals, dyes, cosmetic nail products, and the synthesis of organic chemicals (ATSDR, 1993).

Sources

Natural: Natural sources of toluene include volcanoes, forest fires, and crude oil (Howard, 1990).

Anthropogenic: Anthropogenic sources of toluene include the following: motor vehicle exhaust; emissions from gasoline storage tanks, filling stations, carburetors, etc.; emissions and wastewater from its use as a solvent and thinner for paints, lacquers, etc.; emissions from its production from petroleum, coal, and as a by-product from styrene production; emissions from its use as a chemical intermediate; and tobacco smoke (Howard, 1990).

Environmental Concentrations

The concentrations of toluene in air tend to be quite low in remote areas, but levels of 5 to 25 g/m^3 are common in suburban and urban areas. Automobile emissions are the principal source of toluene in ambient air, with levels fluctuating in proportion to automobile traffic. Toluene is also a common indoor contaminant, and indoor air concentrations are often several times higher (averaging 30 g/m^3) than outside air. This is believed to be due to release of toluene from common household products (paints, paint thinners, and adhesives) and from cigarette smoke (ATSDR, 1993).

Toluene is occassionally detected in drinking water supplies, but occurrence is not widespread and levels are generally below

3 g/L. In contrast, toluene is a very common contaminant of water and soil in the vicinity of hazardous waste sites, with average concentrations in water of 7 to 20 g/L, and average concentrations in soil of over 70 g/kg (ATSDR, 1993).

Environmental Fate

Terrestrial: If toluene is released to soil, it will be lost by evaporation from near-surface soil and microbial degradation. Since it is relatively mobile in soil, it may leach into the groundwater where slow biodegradation may occur. It will not significantly hydrolyze under normal environmental conditions (Howard, 1990).

Aquatic: If toluene is released into water, it will be lost by both volatization to the atmosphere and biodegradation. The predominant process will depend on water temperature, mixing conditions, and the existence of acclimated microorganisms at the site. The half-life will range from days to several weeks. It will not significantly hydrolyze, directly photolyze, adsorb to sediment, or bioaccumulate in aquatic organisms (Howard, 1990).

Atmospheric: If toluene is released to the atmosphere, it will exist predominantly in the vapour phase. It degrades moderately rapidly by reaction with photochemically produced hydroxyl radicals. Its half-life ranges from 3 hours to somewhat over a day. It is very effectively washed out by rain. It will not be subject to direct photolysis in sunlight (Howard, 1990).

Absorption, Metabolism and Excretion

Toluene is readily absorbed from the respiratory and gastrointestinal tracts and to a lesser extent through the skin. Animals given toluene orally or by inhalation had high concentrations of toluene in their adipose tissue and bone marrow, and moderately high concentrations of toluene and its metabolites in the liver and kidney. The initial step in metabolism is side-chain hydroxylation followed by oxidation to benzoic acid. Benzoic acid is then conjugated with glycine to form hippuric acid. In both humans and animals, 60 to 75% of inhaled toluene that is absorbed can be accounted for as hippuric acid in the urine. Much of the remaining toluene is exhaled unchanged. The excretion of toluene and its metabolites is rapid, with the major portion occurring within 12 hours of exposure (ATSDR, 1993).

Toxicity

The primary target of toluene appears to be the central nervous system. Occupational data suggests that chronic toluene exposure impairs behavioural function as determined by measurements of cognitive performane, neurasthenic complaints, visual acuity, neuromuscular function, and odour discrimination (ATSDR, 1993).

Mortality reports in humans due to exposure to toluene have generally not provided information on dose and thus, do not provide a basis for quantitative estimates. In one fatal case following oral ingestion of toluene, the cause of death appeared to be a profound disruption of central nervous system function (ATSDR, 1993).

The primary effect of toluene on the respiratory tract following inhalation is irritation. Studies with human volunteers and exposed workers have demonstrated that toluene is a mild to moderate respiratory irritant. Individuals exposed once to moderate concentrations of toluene (800 ppm) for 7 to 8 hours or 1,890 ppm for 2 hours experienced no respiratory effects. However, irritation of the upper respiratory tract was observed in workers exposed for several years to 200 to 800 ppm toluene. Animal studies reported respiratory irritation and pulmonary lesions in rats exposed to high concentrations of toluene. Rats exposed to 600 ppm for 5 weeks (7 hours/day) had irritated tissue in the upper airway and rats exposed to 2,500 to 5,000 ppm had pulmonary lesions. Inflammation of the nasal mucosa, erosion and metaplasia of the olfactory epithelium, and degeneration of the respiratory epithelium was reported in rats exposed to toluene at 600 to 1,200 ppm for 2 years (6.5 hours/day, 5 days/week) . These effects were not observed in mice at the same concentrations. In rats exposed chronically (24 months) to lower doses of toluene (300 ppm), no histopathological lung lesions attributable to toluene exposure were observed (ATSDR, 1993).

Toluene inhalation is associated with alterations of the heart rhythm for both humans and animals. There may be individual differences in the cardiac response to toluene that make some individuals more susceptible than others to potentially fatal arrhythmias; the degree of hypoxia may also be important. One person exposed for 2 hours to less than 1,890 ppm toluene exhibited a rapid heartbeat (sinus tachycardia), while the second person, exposed for 3 hours, exhibited a slow heartbeat (bradycardia). Increased relative heart weights were seen in rats exposed to toluene at 1,250 mg/kg/day for 13 weeks and myocardial degeneration was seen in mice exposed to 5,000 mg/kg/day. All of the mice receiving 5,000 mg/kg/day died during the first weeks of exposure. The exposures associated with cardiac rhythm disturbances were of the short-term, high-level type experienced by substance abusers. Therefore, cardiovascular responses are not expected to occur following toluene exposure at or near hazardous waste sites, unless some occurrence releases a high concentration of toluene into an enclosed area (ATSDR, 1993).

The only gastrointestinal effects reported after exposure to toluene by either inhalation, oral, or dermal routes has been ulceration of the forestomach of rats exposed to 600 and 1,200 ppm for 2 years. Similar effects were not seen in mice exposed under the same conditions or to rats or mice orally exposed to 2,500 mg/kg/day for 13 weeks. Therefore, it is unlikely that toluene exposure resulting from the contamination of hazardous waste sites would cause gastrointestinal effects in any exposed population (ATSDR, 1993).

Humans have reported eye irritation following exposure to toluene vapours. Human subjects exposed acutely to toluene concentrations of 100 ppm and greater developed irritation of the eyes. No effects were observed at lower doses. This is probably the result of direct contact of toluene vapour with the outer surface of the eye. Slight to moderately severe irritation of rabbit eyes has been reported following direct application of toluene to the conjunctiva. Skin irritation can also occur in humans and animals dermally exposed to toluene. This appears to be due to the degreasing action of toluene and its removal of protective skin oils (ATSDR, 1993).

Weight loss has been reported to occur in rats exposed to toluene via inhalation for periods of 11 to 23 weeks. In case studies of toluene abusers, nausea and anorexia have been reported. These symptoms may explain the weight loss observed in animal studies (ATSDR, 1993).

The primary effect associated with inhalation exposure of humans to toluene is depression of the central nervous system. Inhalation exposures of humans to toluene in the range of 100 to 500 ppm have elicited central nervous system effects such as fatigue, confusion, and uncoordination, as well as impairments in reaction time, perception, and motor control and function. Occupational exposures to high concentrations of toluene and prolonged abuse of toluene have led to several case reports of residual or permanent central nervous system effects. Examinations reveal changes in the intensity of the white matter signal and a breakdown of the grey matter-white matter boundary, which correlates with the degree of brain disfunction (ATSDR, 1993).

Human and animal studies do not support a concern for the carcinogenicity of toluene. The only available human epidemiological studies were negative but inconclusive due to limitation in design and the animal bioassays were all negative (ATSDR, 1993).

Regulatory Levels

Chronic RfD: oral - 0.2 mg/kg-day
inhalation - 0.114 mg/kg-day
MCL: 1.0 mg/L
AWQC: water and fish - 14.3 mg/L
fish only - 424 mg/L
TLV-TWA: 50 ppm or 180 mg/m^3 (ACGIH, 1993-94).
EPA Carcinogen Classification: Group D (not classified - inadequate evidence of carcinogenicity in animals)
Reference: IRIS, April 1994 (unless otherwise indicated).

1.10 1,1,1-TRICHLOROETHANE (1,1,1-TCA)

General Properties
Atomic Weight: 133.4 g/mol
Melting Point: -30.4°C
Boiling Point: 74.1°C
Specific Density: 1.3390 (@ 20°C)
Water Solubility: 4,400 mg/L (@ 20°C)
Vapour Pressure: 100 mm Hg (@ 20°C)
Henry's Law Constant: 8×10^{-3} atm-m^3/mol (Howard, 1990).
Reference: Montgomery and Welkom, 1990 (unless otherwise indicated).

Uses

1,1,1-TCA is used as a solvent for adhesives (including food packaging adhesives) and in metal degreasing, pesticides, textile processing, cutting fluids, aerosols, lubricants, cutting oil formulations, drain cleaners, shoe polishes, spot cleaners, printing inks, and stain repellents, among other uses. It is used in industry primarily for cold-cleaning, dip cleaning, bucket cleaning, and vapour degreasing operations of items such as precision instruments, molds, electrical equipment, motors, electronic components and instruments, missile hardware, paint masks, photographic film, printed circuit boards, generators, switchgears, semiconductors, and high vacuum equipment, fabrics, and wigs. It is also used for on-site cleaning of printing presses, food packaging machinery, and molds. 1,1,1-TCA was formerly used as a food and grain fumigant (ATSDR, 1994).

Sources

Natural: 1,1,1-TCA is not known to occur as a natural product (Howard, 1990).

Anthropogenic: 1,1,1-TCA is a man-made compound that is released to the environment by anthropogenic activity. It may be released to the environment by process and fugitive emissions during its manufacture, formulation, and use in both consumer and industrial products. Because 1,1,1-TCA is used as a solvent, volatization to the atmosphere is a likely result of its use (ATSDR, 1994).

Environmental Concentrations

The measured concentration of 1,1,1-TCA in urban air usually ranges from 0.1 to 1 ppb; however, levels < 1,000 ppb have been observed in large urban areas or near hazardous waste sites. Rural levels of 1,1,1-TCA are typically < 0.2 ppb. The long atmospheric lifetime of 1,1,1-TCA allows the compound to be carried a considerable distance from its initial point of release; detectable levels have been measured in numerous remote areas throughout the world (ATSDR, 1994).

1,1,1-TCA has been identified in surface water, groundwater, drinking water, effluent, rain, snow, and urban runoff. The amount of the chemical detected in surface and groundwater depends upon the location of the sampling point. Concentrations in surface water removed from point-source emissions such as industrial wastewater, hazardous waste sites, and spill locations are usually < 1 ppb. Random samples of groundwater taken in the United States have ranged from 0 to 18 ppb. Groundwater samples obtained near sources of release have been as high as 11,000 ppb. Drinking water from surface or groundwater sources contained 1,1,1-TCA concentrations of 0.01 to 3.5 ppb (ATSDR, 1994).

The reported frequency of 1,1,1-TCA in soil samples was 12 of 357 CLP sites with concentrations of 3.5 to 6.6×10^6 ppb (ATSDR, 1994).

Environmental Fate

Terrestrial: If 1,1,1-TCA is released onto soil, it will evaporate fairly rapidly because of its high vapour pressure. It will pass rapidly through soil into groundwater (Howard, 1990).

Aquatic: The primary loss of 1,1,1-TCA from the aquatic environment will be by evaporation into the atmosphere. The half-life will range from hours to a few weeks depending on wind and mixing conditions. Biodegradation and adsorption onto particulate matter will be insignificant relative to volatization (Howard, 1990).

Atmospheric: The dominant atmospheric fate process for 1,1,1-TCA is predicted to be degradation by interaction with photochemically-produced hydroxyl radicals. Direct photochemical degradation of 1,1,1-TCA in the troposphere is not expected to be an important fate process. Because of 1,1,1-TCA's moderate water solubility and its identification in rainwater, rain washout from the atmosphere might occur. 1,1,1-TCA removed by this process would be expected to re-volatize rapidly to the atmosphere. The relatively long tropospheric residence time for 1,1,1-TCA suggests that migration to the stratosphere should be important. Destruction of the compound in the stratosphere is then expected to occur. For 1,1,1-TCA emissions up to 1976, the estimated total ozone loss due to atmospheric 1,1,1-TCA was 0.2%. An estimated 11 to 12% of 1,1,1-TCA released to the atmosphere is expected to survive and migrate to the stratosphere. The estimated atmospheric lifetime of 1,1,1-TCA, which incorporates all removal processes, was 6.2 to 6.3 years. However, these data were obtained by estimating total global production and release, a process that may introduce significant error into the calculations. In a later study, the estimated atmospheric lifetime of 1,1,1-TCA was 5.7 years (ATSDR, 1994).

Absorption, Metabolism and Excretion

Upon first exposure, 1,1,1-TCA rapidly and efficiently absorbed by the lung, the skin (under conditions to prevent evaporation), and the gastrointestinal tract of humans and animals. As the duration of inhalation exposure increases, the percentage not absorbed decreases because steady-state levels are approached in the blood and tissues, and 1,1,1-TCA is metabolized at a low rate (ATSDR, 1994).

Animal studies have demonstrated that, once absorbed, 1,1,1-TCA is distributed by the blood to tissues and organs throughout the body, including developing fetuses, with preferential distribution to fatty tissues (ATSDR, 1994).

1,1,1-TCA is metabolized oxidatively, at low rates, to trichloroethanol and trichloroacetic acid by the cytochrome P-450 mixed-function oxidase system. These metabolites are excreted in the urine; other minor metabolites (CO_2 and acetylene) are excreted in expired air.

Experiments with animals and humans have demonstrated that only small fractions of absorbed 1,1,1-TCA doses (< 10%) are metabolized, regardless of the route of exposure (ATSDR, 1994).

The predominant pathway of elimination of 1,1,1-TCA in humans and animals, regardless of route of exposure, is exhalation of the unchanged compound. When exposure ceases, the compound is rapidly cleared from the body (ATSDR, 1994).

Toxicity

The volatility of 1,1,1-TCA makes acute inhalation the most likely lethal exposure scenario in humans. The acute lethal air concentration for humans in unknown; however, simulations of several lethal exposures suggest that it may be as low as 6,000 ppm. The results of animal studies indicate that the lethal exposure concentration decreases substantially with increasing exposure duration. Human deaths after inhalation exposure have been attributed to respiratory failure secondary to central nervous system depression and cardia arrhythmias. Very little is known about lethality due to ingestion of 1,1,1-TCA. Accidental ingestion of 600 mg/kg was not fatal. Human deaths involving dermal exposure have not been reported and it is extremely unlikely due to the high volatility of 1,1,1-TCA (ATSDR, 1994).

1,1,1-TCA can lower blood pressure (mildly to severely) in humans, but these effects are likely only after exposure to high concentrations of the vapour. Daily exposure to low levels for < 6 years did not affect blood pressure, heart rate, or electrocardiogram results in humans. Reduced blood pressure accompanies exposure to anesthetic conditions of 1,1,1-TCA vapour (10,000 to 26,000 ppm). The effects are not permanent and subside shortly after exposure (ATSDR, 1994).

Nausea, vomiting and diarrhea reportedly occur in humans after acute oral or inhalation exposure to high 1,1,1-TCA levels (ATSDR, 1994).

1,1,1-TCA may be a hepatotoxicant in humans, although the evidence is not conclusive. Mild hepatic changes have been found by liver biopsy in exposed individuals, and at autopsy in individuals who died after acute inhalation exposure to high concentrations of 1,1,1-TCA. Animal studies indicate that exposure to relatively high 1,1,1-TCA concentrations in air (> 1,000 ppm) or high oral doses (> 1,334 ppm) are required to produce liver injury (ATSDR, 1994).

1,1,1-TCA is mildly irritating when applied undiluted to the skin. Effects include mild, transient, reversible erythema and edema. Exposure to 1,1,1-TCA vapour is associated with mild eye irritation in humans (ATSDR, 1994).

Neurological effects are the preeminent signs of acute inhalation exposure to 1,1,1-TCA in humans. The severity of effects in humans during acute inhalation exposure increases as the exposure duration and level are increased. Impaired performance of psychophysiological function tests has been observed in individuals exposed to low concentrations (> 175 ppm). Dizziness, lightheadedness, and loss of coordination are caused by exposure to moderate concentrations (> 500 ppm). General anesthesia occurs at high levels (> 10,000 ppm). There are no reports of irreversible neurological impairment in humans (ATSDR, 1994).

Evidence for or against an association between exposure to 1,1,1-TCA and cancer in humans has not been established. Among animals, no effects were found in well-designed inhalation study at exposure levels <1,500 ppm (ATSDR, 1994).

Regulatory Levels

Chronic RfD: oral - 0.09 mg/kg-day *
inhalation - 0.3 mg/kg-day *
MCL: 0.2 mg/L **
AWQC: water and fish - 18.4 mg/L ***
fish only - 1 x 10^{-3} mg/L ***
TLV-TWA: 350 ppm or 1910 mg/m^3 (ACGIH, 1993-94).

EPA Carcinogen Classification: Group D (not classified - inadequate evidence of carcinogenicity in animals studies) **
References: *HEAST, 1994 **IRIS, April, 1994 ***USEPA, 1986.

1.11 TRICHLOROETHENE (TCE)

General Properties
Atomic Weight: 131.39 g/mol
Melting Point: -73°C
Boiling Point: 87.2°C
Specific Density: 1.4642 (@ 20°C)
Water Solubility: 1,00 mg/L
Vapour Pressure: 57.8 mm Hg (@ 20°C)
Henry's Law Constant: 1.17×10^{-3} atm-m^3/mol
Reference: Montgomery and Welkom, 1990.

Uses

TCE is an excellent extraction solvent for greases, oils, fats, waxes, and tars and is used by the textile processing industry to scour cotton, wool, and other fabrics. The textile industry also uses TCE as a solvent in waterless dying and finishing operations. As a general solvent or as a component of solvent blends, TCE is used with adhesives, lubricants, paints, varnishes, paint strippers, pesticides, and cold metal cleaners (ATSDR, 1992).

Approximately 10 million pounds of TCE is used annually as a chain transfer agent in the production of polyvinyl chloride. Other chemical intermediate uses of TCE include production of pharmaceuticals, polychlorinated aliphatics, flame retardant chemicals, and insecticides. TCE is used as a refrigerant for low temperature heat transfer and in the aerospace industry for flushing liquid oxygen (ATSDR, 1992).

Various products found to contain TCE include typewriter correction fluids, paint removers/strippers, adhesives, spot removers, and rug-cleaning fluids (ATSDR, 1992).

Sources

Natural: TCE is a man-made chemical that does not occur naturally in the environment (ATSDR, 1992).

Anthropogenic: The major TCE emission source is vapour degreasing operations, which eventually release most of the TCE used in this application to the atmosphere. Other emission sources to the atmosphere include relatively minor releases from TCE manufacture, manufacture of other chemicals (similar chlorinated hydrocarbons and polyvinyl chloride), and solvent evaporation losses from adhesives, paints, coatings, and miscellaneous uses. Release of TCE at publicly owned treatment works or waste treatment facilities occurs through volatization from industrial discharges of wastewater containing TCE. TCE is also released to the atmosphere through gaseous emissions from landfills. TCE is released to aquatic systems from industrial discharges of wastewater streams. TCE can also leach to groundwater from landfills. TCE can be released into the soil through industrial discharges and through landfill leachate (ATSDR, 1992).

Environmental Concentrations

Monitoring data for TCE in ambient air in the United States, prior to 1981, were compiled. This compilation, which includes over 2,300 monitoring points, reports mean TCE concentrations of 0.03 ppb in rural/remote areas, 0.460 ppb in urban/suburban areas, and 1.2 ppb in areas near emission sources of TCE (ATSDR, 1992).

TCE has been detected in many drinking water samples collected throughout the United States. Mean and median concentrations of 0.47 and 0.26 ppb of TCE were found in drinking water from 133 U.S. cities using finished surface water supplies. Mean and median concentrations of 6.76 and 0.31 ppb were found in drinking water from 25 U.S. cities using finished groundwater supplies. The EPA Groundwater Supply Survey of 945 drinking water systems nationwide using groundwater sources found TCE in 91 water systems; the median level of the positive samples was approximately 1 ppb, with a single maximum level of 130 ppb (ATSDR, 1992).

An analysis of the EPA STORET Data Base (1980 - 1982) found that TCE had been positively detected in sediment samples taken at 6% of 338 observation stations, with median levels < 5 ppb (ATSDR, 1992).

Environmental Fate

Terrestrial: Spills or releases of TCE to soil will evaporate rapidly due to its reasonably high vapour pressure. TCE appears to be fairly stable in soil although one field study of groundwater contamination from a leaking TCE tank has detected cis- and trans-1,2-dichloroethylene, which suggests that degradation in groundwater can occur. Hydrolysis in not an important process (Howard, 1990). Soil organic carbon sorption coefficients (K_{OC} values) for TCE range from 106 to 460, indicating high-to-medium soil mobility. The components of soil organic matter had widely varying affinities for TCE, with the fats-waxes-resins fraction (K_{OC}=460) being responsible for stronger adsorption of TCE (ATSDR, 1992).

Aquatic: If TCE is released to water, the primary removal process will be evaporation, with a half-life of minutes to hours, depending upon turbulence (Howard, 1990). Oxidation in the aquatic environment does not appear to be a significant fate process, although there is evidence of some oxidation of TCE in aqueous closed systems in the presence of sunlight. In addition, hydrolysis, another potential transformation process for compounds in the aquatic environment, does not occur at a sufficient rate to be important for TCE. TCE has been detected in fruits and vegetables indicating potential bioconcentration by plants. Concentrations measured in tomatoes, potatoes, apples, and pears were 1.7, 0 to 3, 5, and 4 ppb, respectively (ATSDR, 1992). Adsorption to sediment and bioconcentration in aquatic organisms are not important processes (Howard, 1990).

Atmospheric: The atmosphere is the primary recipient of environmental releases of TCE. TCE released to the atmosphere will exist primarily in the vapour phase based on its relatively high vapour pressure (Howard, 1990). The dominant transformation process for TCE in the atmosphere is reaction with sunlight-produced hydroxyl radicals. The degradation products of this reaction include phosgene, dichloroacetyl chloride, and formyl chloride. Direct photolysis of TCE is not an important reaction. TCE was detected in a number of rainwater samples collected in the United States. Physical removal by means of wet deposition is an important environmental fate process with respect to TCE. TCE can be expected to revolatize back to the atmosphere after being deposited by wet deposition (ATSDR, 1992).

Absorption, Metabolism and Excretion

Absorption of TCE is very rapid upon inhalation exposure in humans. Blood and breath levels increased rapidly after initiation of a 4-hour exposure to 100 ppm, peaking within an hour from the start of the exposure. Although no actual rates of absorption have been measured in humans, cases of poisoning following ingestion indicated that absorption of TCE across the gastrointestinal mucosa is extensive. It would be expected to be readily absorbed across the gastrointestinal mucosal barrier in humans because it is an uncharged, nonpolar, and highly lipophilic compound. Rapid dermal absorption of TCE is evident from a study in which peak blood and exhaled air concentrations occurred within 5 minutes after the subject immersed one hand in an unspecified amount of TCE for 30 minutes (ATSDR, 1992).

Inhaled doses of TCE are metabolized extensively in humans. The principal metabolites of TCE are trichloroethanol, trichloroethanol-glucoronide ("urochloralic acid"), and trichloroacetic acid (ATSDR, 1992).

Following inhalation exposure to TCE in humans, the unmetabolized parent compound in exhaled, whereas its metabolites are primarily eliminated in the urine. Excretion of TCE in the bile apparently represents a minor pathway of elimination (ATSDR, 1992). No studies were located regarding excretion after oral exposure of humans to TCE but 72 hours after a single dose of 2, 20, or 200 mg/kg (^{14}C)-TCE in mice and rats was eliminated unchanged in exhaled air and urine, whereas the metabolites are excreted primarily in the urine. Elevated TCE levels in expired air were measured in subjects who immersed one hand in an unspecified concentration of TCE for 30 minutes. No studies were located for humans or animals regarding excretion after dermal exposure to TCE (ATSDR, 1992).

Toxicity

Cases of human deaths have been reported as a result of acute accidental exposure in an occupational setting or by intentionally drinking or breathing large amounts of TCE (i.e., suicides). No deaths due to dermal exposure have been reported. Death is not likely to result from exposure to environmental levels or to levels of TCE found at hazardous waste sites (ATSDR, 1992).

Acute, intermediate, or chronic exposure to TCE by workers or laboratory animals did not result in respiratory irritation or disease. Environmental exposure to TCE in air, water, or soil is not expected to pose a risk to the human respiratory system (ATSDR, 1992).

Chronic cardiovascular disease had not been reported in workers chronically exposed to TCE, although deaths following acute high-level exposures to TCE were attributed to cardiac arrhythmias. One case study is available which indicated that a woman who had accidentally consumed about 20 mL of TCE suffered a myocardial infarction. It is not known whether cardiovascular effects could result from exposure to levels of TCE found at or near hazardous waste sites (ATSDR, 1992).

There are inadequate human data regarding the possible hepatic effects of TCE. People who have been acutely exposed during surgical anesthesia, and most people exposed chronically in the workplace have not had adverse liver effects. However, a few case reports do show minor effects on serum or urinary measures of liver function. There are also a few case reports of persons showing hepatorenal failure following exposure to very large amounts of TCE. It has been suggested that liver damage may result from prolonged exposure but not acute exposures and it is unknown whether exposure to levels of TCE found in and around hazardous waste sites may result in hepatic injury. Liver enlargement is the primary hepatic effect seen in TCE-exposed animals, indicating that TCE may not be as potent a liver toxin as a number of other chlorinated hydrocarbons. Liver weights increased in various strains of mice exposed to 37 to 300 ppm continuously for 30 days. In related studies, mice, rats, and gerbils were exposed to 150 ppm of TCE for up to 30 days. Relative liver weights were increased in all species and treatment groups, but effects were more pronounced in mice (60 to 80% enlargement) than the rats or gerbils (20 to 30% enlargement) (ATSDR, 1992).

People who have been acutely exposed to high levels during surgical anesthesia, or chronically in the workplace, have not had renal toxicity. However, minor changes in urinary and serum indicators of renal function have been found in other workers. In animals, renal enlargement is associated with acute- or intermediate-duration inhalation or oral exposure to TCE. Kidney enlargement appears to be less pronounced and occurs less consistently than liver enlargement (ATSDR, 1992).

Some humans experience dry throats and mild eye irritation following acute inhalation exposure (200 ppm for 7 hours) to TCE. Persons working with TCE for intermediate periods sometimes develop skin burns or rashes and dermatitis. TCE is not known to cause dermal effects when given via the oral route. It is possible that exposure to TCE in the air or soil at hazardous waste sites would be irritating to human eyes or skin (ATSDR, 1992).

In the past, TCE was used as an anesthetic, so it obviously can cause acute central nervous system depression in humans. People have become unconscious after acute exposure to very high levels occasionally present in the workplace. However, the evidence for the critical threshold for acute effects is equivocal and there is no good information on the effects from long-term low-level exposure. Human experimental studies revealed mild effects on motor coordination, visual perception, and cognition. Nonspecific neurological effects from TCE exposure in the workplace have been reported, and include dizziness and drowsiness. Adverse effects at the lowest doses showed drowsiness at < 27 ppm and headache at < 81 ppm for exposures of 1 to 4 hours. Acute and chronic inhalation exposures, as well as chronic oral exposures have led to dysfunction of cranial nerves V and VII (ATSDR, 1992).

Workers who have been exposed to TCE show no higher incidence of cancer than controls. The few studies that did show some association were complicated by exposures to known human carcinogens. Animal studies have shown increases in cancers of various types following inhalation or oral exposure to TCE. The significance of these studies for humans cannot be determined due to other circumstances. Acute oral exposure to TCE or its metabolites preferentially induces peroxisome proliferation in mouse liver, which may be related to the carcinogenic response in mouse liver (ATSDR, 1992).

Regulatory Levels

MCL: 5×10^{-3} mg/L (IRIS, April 1994).
AWQC: water and fish - 2.7×10^{-3} mg/L (USEPA, 1986).
fish only - 8.7×10^{-2} mg/L (USEPA, 1986).
TLV-TWA: 50 ppm or 269 mg/m^3 (ACGIH, 1993-94).

1.12 VINYL CHLORIDE

Vinyl chloride is a man-made product with a mild, sweet odour. It is widely used in the production of polyvinyl chloride (PVC) which is a component of plastic products such as automotive parts, accessories, furnitures, pipes, wires, cable coatings, and packaging materials. At one time, vinyl chloride was used as a coolant, a propellant in spray cans, and in some cosmetics. It is no longer used for these purposes.

Vinyl Chloride is released to the environment from its production and use, emissions from contaminated wastewaters, waste disposal sites and from pyrolysis/combustion of polyvinyl chloride and some vinyl copolymers.

Segments of the general population living in the vicinity of emission sources may be exposed to low levels of vinyl chloride through inhalation of affected air. These exposure levels correspond to an average daily intake of 2100 μg/day assuming an average daily intake of 20 m^3 of air.

Environmental Fate

If vinyl chloride is released to the atmosphere, it can be expected to exist mainly in the vapor phase based on the reported high vapor pressure of 2660 mm Hg at 25°C. Gas phase vinyl chloride is expected to degrade rapidly in air by reaction with photochemically-produced hydroxyl radicals with an estimated half-life of 1.5 days (Howard, 1989).

The predominant removal process of vinyl chloride from water will be by evaporation based on a high Henry's Law constant of 1.07×10^{-2} atm-m^3/mol. A half-life of 0.805 hrs was estimated for evaporation of vinyl chloride from a river 1 m deep with a current of 3 m/sec and a wind velocity of 3 m/sec (Howard, 1989). Adsorption to sediments and bioconcentration in aquatic organisms are not expected to be significant removal processes for vinyl chloride in rivers, lakes and ponds (Howard, 1989). Limited existing data indicates that vinyl chloride is resistant to biodegradation in aerobic systems and therefore, it may not be subject to biodegradation in natural waters.

When released to soil, vinyl chloride will be subject to rapid volatilization based on the high reported vapor pressure of 2660 mm Hg at 25°C. Half-lives of 0.2 and 0.5 days were reported for volatilization from soil at 1 and 10 cm incorporation, respectively. Any vinyl chloride which does not evaporate will be expected to be highly mobile in soil and may leach to groundwater, as indicated by a low K_{oc} value of 29.73 mL/g and a high solubility of 2,763 mg/L.

Toxicity

Human exposure to vinyl chloride occurs primarily through inhalation and less frequently through skin absorption. Acute inhalation exposure to high concentrations of vinyl chloride causes light headedness, some nausea, and possible dulling of visual and auditory responses. These effects may occur within 5 minutes at about 10,000 ppm of vinyl chloride (ATSDR, 1992).

Chronic high level skin exposure may result in the triad of acroosteolysis, Raynaud's phenomenon, and sclerodermatous skin changes. These skin changes occur almost exclusively on workers who are exposed to high concentrations and are not relevant to low level environmental exposures.

Chronic exposure to vinyl chloride has also been associated with hepatic damage. A number of animal studies revealed characteristic hepatic lesions produced by vinyl chloride exposure. The incidence and severity of the effects correlated well with the duration of exposure (ATSDR, 1992).

Acute exposure of animals to extremely high concentrations of vinyl chloride via inhalation has been demonstrated to cause hepatic damage such as increased liver to weight body ratio, liver congestion, fatty degeneration and hypertrophy. Acute exposure (30 minutes) of guinea pigs, mice and rats at 300,00 ppm of vinyl chloride caused liver congestion or severe fatty degeneration (ATSDR, 1992). Exposure of rats to 50,000 ppm for 4 to 6 hours produced no observable effects in the liver.

A single 1-hour exposure of mice to 500, 5,000 or 50,000 ppm of vinyl chloride, followed by an 18-month observation period, resulted in an increased incidence of hepatocellular hypertrophy in the animals at terminal sacrifice (ATSDR, 1992). The hypertrophy was not dose-dependent, thus, the significance of this effect is uncertain.

Chronic exposure studies to low concentrations of vinyl chloride via inhalation have produced hepatic toxicity such as degeneration, swelling of hepatocytes with compression of sinusoids, dilation of rough endoplasmic reticulum, proliferation of smooth endoplastic reticulum, changes in metabolic enzymic activities and increased liver to body weight ratio (ATSDR, 1992). For example, exposure of rats to 500 ppm for 7 hours per day, 5 days per week, for 4.5 months resulted in an increase in liver to body weight ratio and granular degeneration. Exposure of rats to 500 ppm for 5 hours per day, 5 days per week for 10 months caused swelling of hepatocytes and proliferation of reticuloendothelial cells, increased liver weight, and degeneration. An increased 10 ppm of vinyl chloride for 6 hours per day, 6 days per week for 6 months.

Following a 6-month exposure to vinyl chloride, the relative NOAELS for a number of species fall in this order: mice and rats (NOAEL = 50 ppm) < rabbits (NOAEL = 100 ppm) < guinea pigs and dogs (NOAEL >200 ppm).

Vinyl chloride is regarded as a human carcinogen. The most compelling evidence for the carcinogenic potential of vinyl chloride in humans comes from the cluster of reports of greater than expected incidences of angiosarcoma of the liver in workers occupationally exposed to vinyl chloride.

Vinyl chloride is classified as ("A") a known human carcinogen and has an oral CSF of 1.9 $(mg/kg\text{-}day)^{-1}$ (IRIS, 1993).

1.13 XYLENE

General Properties

Atomic Weight: 106.17 g/mol

Melting Point - *p*-xylene: 13.3°C
m-xylene: -47.9°C
o-xylene: -25.2°C

Boiling Point - *p*-xylene: 138.3°C
m-xylene: 139.1°C
o-xylene: 144.4°C

Specific Density - *p*-xylene: 0.8611 (@ 20°C)
m-xylene: 0.8642 (@ 20°C)
o-xylene: 0.8802 (@ 20°C)

Vapour Pressure - *p*-xylene: 10 mm Hg (@ 27.3°C)
m-xylene: 10 mm Hg (@ 28.3°C)
o-xylene: 10 mm Hg (@ 20°C)

Henry's Law Constant - *p*-xylene: 7.66×10^{-3} atm-m^3/mol (ATSDR, 1994).
m-xylene: 7.66×10^{-3} atm-m^3/mol (ATSDR, 1994).
o-xylene: 5.19×10^{-3} atm-m^3/mol (ATSDR, 1994).

Reference: Montgomery and Welkom, 1990 (unless otherwise indicated).

Uses

Approximately 70% of mixed xylene is used in the production of ethylbenzene and the *m*-, *o*-, and *p*-isomers. The remaining mixed xylene is used in solvents, in products such as paints and coatings, or blended into gasoline (ATSDR, 1994).

The xylene isomers are used as industrial solvents and serve as intermediates in synthetic reactions. *m*-Xylene is a chemical intermediate in the production of isophthalic acid, *m*-toluic acid, and isophthalonitrile. *o*-Xylene is a chemical intermediate in the synthesis of phthalic anhydride (for plasticizers), phthalonitrile, 4,4-(trifluoro-1-(trifluoromethyl)ethylidene), diphthalic anhydride (for polyimide polymers), terephthalic acid (for polyesters), isophthalic acid, vitamins, and pharmceuticals. *p*-Xylene is a chemical intermediate for the synthesis of dimethyl terephthalate, terephthalic acid (for polyesters), dimethyl tetrachloroterephthalate, vitamins, and pharmaceuticals. Both *o*- and *p*-xylene are used as components of insecticides (ATSDR, 1994).

Sources

Natural: Xylenes do not occur in the environment naturally except in smoke from forest fires or as constituents of petroleum which may seep into oceans from underground deposits (ATSDR, 1994).

Anthropogenic: Xylenes are released to the atmosphere primarily as fugitive emissions from industrial sources (e.g., petroleum refineries, chemical plants), in automobile exhaust, and through volatization from their use as solvents. Discharges into waterways and spills on land result primarily from use, storage, and transport of petroleum products and waste disposal (ATSDR, 1994).

Environmental Concentrations

Xylenes are ubiquitously distributed in the environment. They have been detected in the atmosphere, rainwater, soils, surface waters, sediments, drinking water, aquatic organisms, and human blood, urine, and expired breath (ATSDR, 1994).

Since one of the largest sources of xylene release into the atmosphere is auto emissions, atmospheric concentrations are related to urbanization. Ambient air concentrations of xylene in industrial and urban areas of the United States have been reported to range from 0.003 to 0.38 mg/m^3 (0.001 to 0.088 ppm). Median *o*-xylene concentrations calculated from a compilation of atmospheric data on organic chemicals were 0.41 g/m^3 (0.094 ppb) in rural/remote areas (114 observations), 5.2 g/m^3 (1.2 ppb) in urban/suburban areas (1,885 observations), and 3.5 g/m^3 (0.81 ppb) in source-dominated areas (183 observations) (EPA, 1983). The median concentrations for the combined m- and p-isomers were 0.38 g/m^3 (0.088 ppb) in rural/remote areas (115 observations), 12 g/m^3 (2.8 ppb) in urban/suburban areas (1,911 observations), and 7.4 g/m^3 (1.7 ppb) in source-dominated areas (186 observations) (ATSDR, 1994).

Surface waters generally contain average xylene concentrations of < 1 ppb total xylenes except in areas where there are fuel processing activities, such as petroleum refining. Typical surface water concentrations range from not detected to 2 g/L. Less than 6% of the groundwater and surface water systems sampled contained detectable levels of xylenes. Typical xylene concentrations (all isomers) ranged from 0.2 to 9.9 g/L (ppb) with mean concentrations of less than 2 g/L (ppb) (ATSDR, 1994).

Virtually no data are available on actual measurements of xylene in soil. While no quantitative data on the presence of xylene in soil were found in the available literature, the rapid volatization of this chemical makes its presence in surface soils unlikely (ATSDR, 1994).

Environmental Fate

Terrestrial: When spilled on land, xylene will volatize and leach into the ground. Xylene degrades in soil under aerobic or anaerobic denitrifying conditions. Under aerobic conditions, 70% degradation after 10 days have occurred. Under anaerobic conditions, a lag period of several months may be required before degradation commences. The extent of xylene degradation will depend on its concentration, residence time in the soil, the nature of the soil, and whether resident microbial populations have been acclimated. Biodegradation has generally only been observed under aerobic conditions, although recently it has also been observed under denitrifying conditions when oxygen is lacking. As aresult of these factors, xylene may biodegrade fairly readily in the subsurface or it may persist for many years (Howard, 1990).

Aquatic: In surface waters, volatization appears to be the dominant removal process (half-life 1 to 5.5 days). Some adsorption to sediment will occur. Although xylene is biodegradable and has been observed to degrade in seawater, there are insufficient data to assess the rate of this process (Howard, 1990).

Atmospheric: When released into the atmosphere, xylene may degrade by reaction with photochemically produced hydroxyl radicals (half-life 1.7 hours in summer and 18 hours in winter). It will also be scavenged by rain (Howard, 1990).

Absorption, Metabolism and Excretion

Studies in humans and animals have shown that xylenes are well asorbed by the inhalation and oral routes. Approximately 60% of inspired xylene is retained and approximately 90% of ingested xylene is absorbed. Absorption of xylene also occurs by the dermal route, but to a much lesser extent than by the inhalation and oral routes (ATSDR, 1994).

Following absorption, xylene is rapidly distributed throughout the body by way of the systemic circulation. In the blood, xylene is primarily bound to serum proteins. Xylene accumulates primarily in adipose tissue (ATSDR, 1994).

Xylene is primarily metabolized by oxidation of a methyl group and conjugation with glycine to yield methylhippuric acid. All three isomers of xylene are metabolized in this way (ATSDR, 1994).

In humans exposed to xylene, greater than 90% of xylene is excreted in the urine as methylhippuric acid. Aromatic hydroxylation of xylene to xylenol occurs only to a limited extent in humans. Less than 2% of an absorbed dose is excreted in the urine as xylenol. Other minor metabolites found in urine include methylbenzyl alcohol and glucoronic acid conjugates of the oxidized xylene. In humans, about 95% of the absorbed xylene is excreted in the urine, with about 5% excreted unchanged in the exhaled air (ATSDR, 1994).

Toxicity

Xylene can be fatal to both humans and animals following acute exposure via inhalation and/or oral route to very high amounts. Death has been observed in animals following dermal exposure to 3,228 mg/kg/day of mixed xylene, but no cases regarding death from dermal exposure have been reported in humans. The amount of xylene necessary to cause death is relatively large in both animals and humans, and reports of death in humans following inhalation exposure to 10,000 ppm xylene occurred in areas of poor ventilation. Therefore, it is unlikely that inhalation, ingestion or dermal contact of the small amounts of xylene likely to be present in contaminated water, air, or soil would pose a risk of death (ATSDR, 1994).

In humans, acute inhalation of 200 ppm mixed xylene for 3 to 5 minutes produced nose and throat irritation. Severe lung congestion with pulmonary hemorrhages and edema was noted in a worker who died following acute inhalation of paint fumes containing about 10,000 ppm xylene. In addition, chronic occupational exposure to xylene vapours (concentration unspecified) has been associated with laboured breathing and impaired pulmonary function. It is possible that persons exposed to xylene vapours at hazardous waste sites may experience some nose and throat irritation. Insufficient evidence is available to conclude whether chronic low-level exposure may result in impaired pulmonary function (ATSDR, 1994).

In some reports, chronic occupational exposure of workers to xylene (concentration unspecified) by inhalation has been associated with increased heart palpitation and abnormal ECGs. These reports provide no conclusive evidence that xylene causes cardiovascular effects in humans because exposure conditions were not well characterized and workers may have been exposed to other chemical agents as well. Cardiovascular effects observed in rats following acute and intermediate inhalation exposure to very high levels (unspecified) of xylene have included ventricular repolarization disturbances, atrial fibrillation, arrythmias, occasional cardiac arrest, and changes in ECG. Morphological changes in coronary microvessels have also been observed in rats exposed to 230 ppm xylene (composition unspecified) (ATSDR, 1994).

Nausea, vomiting, and gastic discomfort have been noted in workers following inhalation of high concentrations of xylene; however, the exposure concentrations of xylene were not reported. If sufficiently high levels of exposure occur at hazardous waste sites, some degree of nausea may occur (ATSDR, 1994).

Human data regarding the hepatic effects following inhalation of xylene are limited to several case and occupational studies. These studies provide limited evidence for evaluating the hepatic effects of xylene in humans because these subjects were concurrently exposed to other chemical agents in addition to xylene. Available animal studies indicate that acute exposure to 2,000 ppm and intermediate exposure to 345 or 800 ppm mixed xylene and/or individual isomers produce a variety of mild hepatic effects, and they provide evidence that humans might be at increased risk of developing such effects following xylene exposure to high concentrations. Effects seen in animals include: increased hepatic cytochrome P-450 and b5 content, increased hepatic weight, increased changes in the distribution of hepatocellular nuclei, congestion of liver cells, and/or degeneration of the liver. Many of the observed hepatic effects in animals following inhalation and oral exposure to xylene were probably caused by an increased rate of metabolism of the liver induced by the solvent and were not necessarily adverse effects. Therefore, it is unlikely that hepatotoxicity would result from exposures at hazardous waste sites (ATSDR, 1994).

There is suggestive evidence that subjects exposed by inhalation to solvent mixtures containing xylene may be at an increased risk of developing renal dysfunction and/or renal damage at high concentrations. No human data were available regarding the renal toxicity of xylene following oral or dermal exposure (ATSDR, 1994).

Dermal exposure of humans to xylene causes skin irritation, dryness and scaling of the skin, and vasodilation of the skin. Exposure of humans to 460 ppm xylene vapours causes ocular irritation (ATSDR, 1994).

Decreased lymphocyte count and decreased serum complement were reported in workers exposed to 0.13 ppm xylene and other solvents for 0.25 to 18 years (ATSDR, 1994).

Neurological effects in humans following oral or dermal exposure to xylene have not been studied. Results from experimental studies with humans indicate that acute inhalation exposure to 100 ppm mixed xylene causes impaired short-term memory, impaired reaction time, performance decrements in numerical ability, and alterations in equilibrium and body balance. Available case and occupational studies together provide suggestive evidence that acute and chronic inhalation exposure to xylene or solvent mixtures containng xylene may be associated with many neurological effects and symptoms (ATSDR, 1994).

Findings in animal studies suggest that adverse effects might occur in the offspring exposed to xylene or its isomers. Results of studies with rats and mice indicate that inhalation exposure to 500 ppm mixed xylene or 700 ppm *m*-xylene, 350 *o*-xylene, or 691 ppm *p*-xylene may induce increased fetal death, decreased fetal weight, delayed skeletal development, skeletal anomalies, enzymatic changes in fetal organs, and maternal toxicity. Dermal exposure of rats to xylene has been associated with biochemical changes in fetal and maternal brain tissue (ATSDR, 1994).

Very limited data were available regarding the development of cancer in humans following inhalation, oral, or dermal exposure to mixed xylene or individual isomers. Animal carcinogenicity data for the xylenes are limited to oral studies with 500 or 1,000 mg/kg/day mixed xylene and dermal studies in which the isomeric composition of the xylene was not specified, exposure durations were less than lifetime, and exposures involved multiple chemicals. No animal carcinogenicity data for xylene were available for inhalation exposure. Because of the limited data, no conclusions can be drawn regarding the relationship between xylene exposure and cancer in humans (ATSDR, 1994).

USEPA has not classified xylenes as a carcinogen (Group D) due to inadequate evidence of carcinogenicity in animal studies. The chronic oral Reference Dose (RfD) is 2 mg/kg-day taken from the Integrated Risk Information System (IRIS) database, April 1994.

Regulatory Levels

Chronic RfD: oral - 2 mg/kg-day (IRIS, April 1994).

MCL: 10 mg/L (USEPA, July 1992).

TLV-TWA: 100 ppm or 434 mg/m^3 (ACGIH, 1993-94).

EPA Carcinogen Classification: Group D (not classified - inadequate evidence of carcinogenicity in animal studies) (IRIS, April 1994).

2.0 METALS

2.1 CADMIUM

General Properties

Atomic Number: 48
Atomic Weight: 112.41 g/mol
Melting Point: 320.9°C
Boiling Point: 765°C
Specific Density: 8.65 (@ 20°C)
Vapour Pressure: 1 mm Hg (@ 394°C)
Oxidation State: +2
Reference: Weast, 1986-87.

Uses

Cadmium is currently used primarily for the production of nickel-cadmium batteries (35%) and for metal plating (30%). Cadmium is also used for pigments (15%), for plastics and synthetics (10%), and for alloys and other miscellaneous uses (10%) (ATSDR, 1992).

Sources

Natural: Cadmium is an element found in the earth's crust at concentrations of about 1 to 2 ppm, therefore it is released to the enviroment by natural processes. It may be released to the air from entrainment of dust particles, volcanic eruptions or other natural processes. Cadmium may be released to water by natural weathering processes (ATSDR, 1992).

Anthropogenic: Major industrial sources of cadmium emissions include zinc, lead, and cadmium smelting operations, coal and oil-fired boilers, pigment manufacturing plants, and municipal and sewage sludge incineration. Releases to water include discharge from industrial facilities or sewage treatment plants, or by leaching from landfills or soils. Land-disposal of cadmium-containing wastes, land application of sewage sludge, and the use of phosphate fertilizers are the principal sources of cadmium releases to soil (ATSDR, 1992).

Environmental Concentrations

Mean levels of cadmium in ambient air range from less than 1x10^{-6} mg/m^3 in remote areas to 5x10^{-6} to 4x10^{-5}mg/m^3 in U.S. urban areas. Atmospheric concentrations of cadmium are generally highest in the vicinity of cadmium-emitting industries such as smelters, municipal incinerators, or fossil fuel combustion facilities (ATSDR, 1992).

The cadmium concentration of natural surface water and groundwater is usually less than 1 g/L. Most drinking water supplies in the U.S. probably do not contain more than 1 g cadmium/L. Cadmium has been detected in water samples collected from all of the Great Lakes (ATSDR, 1992).

Cadmium concentrations in nonpolluted soil is highly variable, depending upon sources of minerals and organic material. Mean levels in uncontaminated topsoil in the United States are approximately 0.25 ppm. Topsoil concentrations are often more than twice as high as subsoil levels as the result of atmospheric fallout and contamination (ATSDR, 1992).

Environmental Fate

Terrestrial: Cadmium in soils may leach into water, especially under acidic conditions. Cadmium-containing soil particles may also be entrained into the air or eroded into water, resulting in dispersion of cadmium into these media. Transformation processes for cadmium in soil are mediated by sorption and desorption from water, and include precipitation, dissolution, complexation, and ion exchange. Important factors affecting transformation in soil include the cation exchange capacity, the pH, and the content of clay minerals, carbonate minerals, oxides, organic matter, and oxygen (ATSDR, 1992).

Aquatic: Cadmium is more mobile in aquatic environments than most other heavy metals, such as lead. In natural waters, most cadmium will exist as the hydrated ion ($Cd(+2)\dagger 6H_2O$). Cadmium complexed with humic substances is also an important form of cadmium in polluted waters. Cadmium concentration in water is inversely related to the pH and the concentration of organic material in the water. Since cadmium exists only in the +2 oxidation state, aqueous cadmium is not strongly influenced by the oxidizing or reducing potential of the water. However, under reducing conditions, cadmium may form cadmium sulphide, which is poorly soluble and tends to precipitate. Precipitation and sorption to mineral surfaces and organic materials are the most important removal processes for cadmium compounds. Cadmium is not known to form volatile compounds, so partitioning from water to the atmosphere does not occur. Photolysis is not an important mechanism in the aquatic fate of cadmium compounds, nor is biological methylation likely to occur (ATSDR, 1992).

Atmospheric: Cadmium and its compounds may exist in air as suspended particulate matter derived from sea spray, industrial emissions, combustion of fossil fuels, or the erosion of soils. Cadmium emitted to the atmosphere from combustion processes is usually associated with very small particulates that are in the respirable range (< 10 m) and are subject to long-range transport. These cadmium pollutants may be transported from 100 to a few thousand kilometres and have a typical atmospheric residence time of about 1-10 days before deposition occurs. Larger cadmium-containing particles from smelters and other pollutant sources are also removed from the atmosphere by gravitational settling, with substantial depostition in areas downwind of the pollutant source. Cadmium-containing particulates may dissolve in atmospheric water droplets and be removed by wet deposition. The reported median concentration in precipitation is about 0.7 g/L in rural and urban areas (ATSDR, 1992).

Absorption, Metabolism and Excretion

After inhalation, large particles (> 10 m in diameter) tend to be deposited in the upper airway, while small particles (≈ 0.1 m) tend to penetrate into the alveoli. Particle size, which controls alveolar deposition, is a key determinant of cadmium absorption in the lung. Most ingested cadmium passes through the gastrointestinal tract without being absorbed. Although dermal absorption is slow, it may be of concern in situations where concentrated solutions may contact the skin for several hours or longer or where the potential for dermal exposure is considerably greater than for inhalation or oral exposure (ATSDR, 1992).

Cadmium is widely distributed in the body, with the major portion of the body burden located in the liver and kidney. Cadmium is not known to undergo any direct metabolic conversions such as oxidation, reduction, or alkylation. The cadmium (+2) ion does bind to anionic groups (especially sulfhydryl groups) in proteins (especially albumin and metallothionein). Cadmium is circulated bound to these two proteins (ATSDR, 1992).

Most cadmium that is inhaled or ingested is excreted in the feces. However, almost all excreted cadmium represents material that was not absorbed from the gastrointestinal tract. Most absorbed cadmium is excreted very slowly, with urinary and fecal excretion being approximately equal (ATSDR, 1992).

Toxicity

Cadmium is a cumulative toxicant, and the human exposure conditions of most concern are long-term exposure to elevated levels in the diet. For populations surrounding hazardous waste sites, increased dietary consumption could occur from cadmium-contaminated dust on food or hands, from garden vegetables or fruit grown in cadmium-contaminated soil, and from cadmium-contaminated water used for drinking or garden irrigation. Fugitive dust emissions from cadmium-contaminated soil would expose such populations by the inhalation route (ATSDR, 1992).

High levels of exposure to cadmium by the inhalation or oral routes can cause death in humans and animals. It has been estimated that exposure via inhalation to 1 mg/m^3 for 8 hours could cause some deaths among exposed humans. The doses ingested in 2 known fatal cases were estimated to be 25 mg/kg and 1500 mg/kg. The cause of death is pulmonary edema following inhalation exposure and massive fluid imbalance and widespread gastrointestinal, liver, and other organ damage following oral exposure (ATSDR, 1992).

Acute inhalation exposure to cadmium at concentrations above 0.5 mg/m^3 may cause destruction of lung epithelial cells, resulting in pulmonary edema, tracheobronchitis, and pneumonitis in both humans and animals . Longer-term inhalation exposure at lower levels can also lead to decreased lung function and emphysema. Some tolerance to cadmium-induced lung irritation develops in exposed humans. Lung damage has also been seen following intermediate duration oral cadmium exposure in rats at a dose of 1 to 2 mg/kg/day, but the lung effects are likely to be related to liver or kidney damage and subsequent changes in metabolism. Nonoccupational exposure to cadmium is unlikely to be high enough to cause respiratory effects (ATSDR, 1992).

In examining effects of cadmium on the cardiovascular system, conflicting evidence is seen. In some studies on rats and rabbits, cadmium exposure was shown to increase blood pressure or to cause cardiac lesions. However, studies of exposed humans have found positive, negative, and no association between cadmium exposure and hypertension. This suggests that if cadmium does affect blood pressure, the magnitude of the effect is small compared to other determinants of hypertension (ATSDR, 1992).

The gastrointestinal tract is the largest target organ for high level, acute oral exposure to cadmium in both humans and animals. The main symptoms following ingestion of cadmium at doses above about 0.07 mg/kg in humans are nausea, vomiting, and abdominal pain. Gastrointestinal toxicity is not observed in humans or animals after lower levels of oral or inhalation exposure to cadmium, indicating that gastrointestinal effects are not likely to occur from environmental exposures to cadmium (ATSDR, 1992).

Both oral and inhalation exposure to cadmium can cause anemia in humans and animals. Prolonged exposure of humans to cadmium at levels causing renal dysfunction can lead to painful and debilitating bone disease after inhalation or oral exposure. Human and animal studies suggest that lower level chronic exposure to cadmium causes alterations in renal metabolism of vitamin D, which then may cause milder bone effects (osteoporosis). Cadmium accumulates in the liver following inhalation or oral exposure in humans, but there is little evidence for liver damage in humans exposed to cadmium (ATSDR, 1992).

The kidney is the main target organ for cadmium toxicity following intermediate- or chronic-duration exposure by the inhalation or oral routes (ATSDR, 1992).

Cadmium has been shown to be a developmental toxin by the inhalation, oral, and parenteral routes in animals. The most sensitive indicator of developmental toxicity appears to be impaired neurological development. The lowest exposures shown to cause these effects in animals are 0.02 mg/m^3, 5 hours per day, 5 day per week, by inhalation and 0.04 mg/kg/day, 5 days per week, orally (ATSDR, 1992).

The evidence that cadmium inhalation can cause lung cancer in humans is rather weak, but strong evidence exists that cadmium inhalation can cause lung cancer in rats. No studies were located providing evidence that humans or animals orally exposed to cadmium had increased incidences of cancer (ATSDR, 1992).

USEPA classifies cadmium as a probable human carcinogen (Group B1) with limited evidence in humans. As previously stated, there is strong evidence which suggests that cadmium inhalation can cause lung cancer in rats.

The USEPA Cancer Slope Factor (CSF) for cadmium is 6.3 (mg/kg-day)$^{-1}$ by the inhalation route. The USEPA final Reference Dose (RfD) (chronic) for cadmium is 5x10^{-4} mg/kg-day for water and 1x10^{-3} mg/kg-day for food. These values were taken from the Integrated Risk Information System (IRIS) database, April 1994.

Regulatory Levels
Chronic RfD: oral - 5x10^{-4} mg/kg-day (water)
- 1x10^{-3} mg/kg-day (food)
Chronic CSF: inhalation - 5.14x10^{-7} (mg/kg-day)$^{-1}$
MCL: 5x10^{-3} mg/L
AWQC: water and fish - 0.01 mg/L
TLV-TWA: 0.002 mg/m^3 (ACGIH, 1993-94).

EPA Carcinogen Classification: Group B1 (probable human carcinogen - limited evidence in humans)
Reference: IRIS, April 1994 (except where otherwise noted).

2.2 CHROMIUM

General Properties
Atomic Number: 24
Atomic Weight: 51.996 g/mol
Melting Point: 1,857°C
Boiling Point: 2,672°C
Specific Density: 7.19 (@ 20°C)
Vapour Pressure: 1 mm Hg (@ 1,616°C)
Oxidation State: +2, +3, +6
Reference: Weast, 1986.

Uses

The metallurgical, refractory, and chemical industries are the fundamental users of chromium. In the metallurgical industry, chromium is used to produce stainless steels, alloy cast irons, nonferrous alloys, and other miscellaneous materials. Ferrochromiums are the main intermediates used by the metallurgical industry. In the refractory industry, chromium is a component in chrome and chrome-magnesite, magnesite-chrome bricks, granular chrome-bearing, and granular chromite. In the chemical industry, chromium is used primarily in pigments (both chromium [III] and chromium [VI]), metal finishing (chromium [VI]), leather tanning (chromium [III]), and wood preservatives (chromium [VI]). Smaller amounts are used in drilling muds, water treatment as rust and corrosion inhibitors, chemical manufacturing, textiles, toners for copying machines, magnetic tapes, and as catalysts (ATSDR, 1992).

Sources
Natural: Chromium occurs naturally in the earth's crust. Continental dust is the main natural source of chromium in the environment; volcanic dust and gas flux are minor natural sources of chromium (ATSDR, 1992).

Anthropogenic: Of the total atmospheric chromium emissions from man-made sources in the United States, ≈ 64% is due to chromium (III) from coal and oil combustion and steel production, and 32% is due to chromium (VI) from chemical manufacture, primary metal production, chrome plating, and cooling towers. Electroplating, leather tanning, and textile industries release large amounts of chromium to surface waters (Fishbein, 1981). Disposal of chromium-containing commercial products and coal ash from electric utilities and other industries are the major sources of chromium released to soil. Solid waste and slag produced during the roasting and leaching processes of chromate manufacturing can be potential sources of chromium exposure when disposed of improperly in landfill sites (ATSDR, 1992).

Environmental Concentrations

The arithmetic mean concentration of total chromium in the ambient air in U.S. urban and nonurban areas monitored during 1977-1980 ranged from 0.005 to 0.16 μg/m^3. The chromium concentrations in U.S. river waters usually range from < 1 to 30 μg/L, with a median value of 10 μg/L (EPA, 1984). The total chromium concentrations in U.S. drinking water range from 0.4 to 8.0 μg/L, with a mean value of 1.8 μg/L. Total chromium concentrations in conterminous U.S. soils range from 1.0 to 2,000 mg/kg, with a mean of 37.0 mg/kg. The typical chromium levels in most fresh foods are < 50 μg/kg (ATSDR, 1992).

Environmental Fate

Terrestrial: Chromium in soil is present mainly as the insoluble oxide $Cr_2O_3 \bullet nH_2O$ (EPA, 1984). Therefore, it is not very mobile in soil. Flooding of soils and the subsequent anaerobic decomposition of plant detritus matters may increase the mobilization of chromium (III) in soils due to formation of soluble complexes. This complexation may be facilitated by a lower soil pH. The mobility of soluble chromium in soil will depend on the sorption characteristics of the soil. The sorption of chromium to soil depends primarily on the clay content of the soil and, to a lesser extent, on Fe_2O_3 and the organic content of the soil. Chromium in soil may be transported to the atmosphere as an aerosol. Surface runoff from soil can transport both soluble and bulk precipitate of chromium to surface water. Soluble and unabsorbed chromium (VI) and chromium (III) complexes in soil will leach into groundwater (ATSDR, 1992).

Aquatic: Since chromium compounds cannot volatize from water, transport of chromium from water to the atmosphere is not likely. Most of the chromium released into water will ultimately be deposited in the sediment. Soluble chromium generally accounts for a very small percentage of the total chromium. Soluble forms and suspended chromium can undergo intramedia transport. Chromium (VI) in water will eventually be reduced to chromium (III) by organic matter in the water. It has been estimated that the residence time of chromium (total) in lake water ranges from 4.6 to 18 years (ATSDR, 1992).

Atmospheric: Chromium is present in the atmosphere primarily in particulate form. Naturally occurring gaseous forms of chromium are rare. The transport and partitioning of particulate matter in the atmosphere depend largely on particle size and density. Atmospheric particulate matter is deposited on land and in water via wet and dry deposition. The wet deposition ratio increases with particle size and decreases with precipitation intensity. Chromium particles of aerodynamic diameter < 20 μm may remain airborne for a longer period of time and be transported for greater distances than larger particles. In the atmosphere, chromium (VI) may be reduced to chromium (III) and conversely chromium (III) may be oxidized to chromium (VI) by reaction with various atmospheric compounds (ATSDR, 1992).

Absorption, Metabolism and Excretion

The absorption of inhaled chromium compounds depends on a number of factors, including physical and chemical properties (oxidation state, size, solubility) and the activity of alveolar macrophages. The identification of chromium in urine and serum of humans occupationally exposed to soluble chromium (III) or chromium (VI) compounds in air indicates that chromium can be absorbed from the lungs. In most cases, chromium (VI) compounds are more readily absorbed from the lungs than chromium (III) compounds, due in part to differences in the capacity to penetrate biological membranes. Approximately 0.5 to 2.0% of chromium is absorbed via the gastrointestinal tract. The absorption efficiency is dependent upon dietary intake. At low levels of dietary intake (10 µg), ≈ 2.0% of the chromium is absorbed. When intake increases to > 40 µg, the absorption efficiency drops to ≈ 0.5%. Both chromium (III) and chromium (VI) can penetrate human skin to some extent. Systemic toxicity has been observed in humans following dermal exposure to chromium compounds, indicating significant cutaneous absorption (ATSDR, 1992).

Chromium (III) compounds are essential to normal glucose, protein, and fat metabolism. In addition, chromium (III) is capable of forming complexes with nucleic acids and proteins. Chromium (VI) does not combine with nucleic acids and proteins unless it is first converted to chromium (III). In the lungs, chromium (VI) can be reduced to chromium (III) by ascorbate (ATSDR, 1992).

Following inhalation exposure, the majority of chromium was excreted in the urine, with a short half-time for excretion. Excretion following oral exposure was mainly in the feces, with very small amounts excreted in the urine. Following dermal exposure, it appears that chromium is excreted in the urine shortly after exposure and in the feces later (ATSDR, 1992).

Toxicity

In general, chromium (VI) compounds are more toxic than chromium (III) compounds.

Human death has resulted from accidental or intentional ingestion or dermal exposure to chromium (VI) compounds. In addition, a man died after being immersed in a vat of a solution containing chromium (III) sulfate. Although no studies were located regarding death in humans after acute inhalation exposure to chromium compounds, occupational exposure to chromium via inhalation has been associated with increased mortality due to lung cancer and noncancer lung disease (ATSDR, 1992).

The respiratory tract is the major target of inhalation exposure to chromium (III) and chromium (VI) compounds in humans and animals. Human exposure to either chromium (III) or chromium (VI) compounds has resulted in perforations and ulceration of the nasal septum, bronchitis, pneumoconiosis, decreased pulmonary function, pneumonia, rhinorrhea, nasal itching and soreness, and epistaxis. Nasal irritation and atrophy and decreases in pulmonary function can occur at occupational exposure levels as low as 0.002 mg chromium (VI)/m^3. The effects of chromium (III) and chromium (VI) on the respiratory system have been observed in animals. Chronic exposure of rats to a 3:2 mixture of chromium (VI) and chromium (III) oxides caused interstitial fibrosis and thickening of the septa of the alveolar lumens. It is possible that inhalation exposure to chromium (VI) or chromium (III) compounds could result in respiratory effects in people living near or working at hazardous waste sites (ATSDR, 1992).

Cardiovascular effects, such as changes in the bioelectric and mechanical activity of the myocardium, were reported in potassium dichromate production workers in Russia, but studies of chromate workers in Italy and the United States found no electrocardiogram abnormalities or association with heart disease or blood pressure. No histopathological cardiac lesions were observed in rats exposed chronically to diets containing chromium (III) oxide or drinking water containing chromium (III) acetate. Based on the limited information in humans, the possibility that inhalation, oral, and dermal exposure to chromates can result in some cardiovascular effects cannot be ruled out (ATSDR, 1992).

Workers in chromate plant exposed to high levels of atmospheric chromium (III) and chromium (VI) have developed gastric ulcers and gastritis as a result of swallowing chromium dust during mouth breathing. Stomach pain, duodenal ulcer, gastritis, and stomach cramps have also been reported in other studies of workers engaged in chromate production and electroplating but not in workers engaged in chromium (III) production. Abdominal pain, vomiting, and gastrointestinal hemorrhage have occurred in humans who eventually died after ingesting chromium (VI) as various chromium compounds. It is reasonable that gastrointestinal irritation can occur in humans exposed to chromium (VI) compounds at hazardous waste sites by any route (ATSDR, 1992).

Hematological evaluations of workers occupationally exposed to chromium compounds have yielded equivocal results. Leukocytosis or leukopenia has been observed in workers exposed to chromium (III) and chromium (VI) in a chromate plant. Other studies examined hematological parameters of chromate and dichromate production workers and stainless steel welders, however, the only hematological effect observed was increased sedimentation rate of red blood cells. Chronic exposure of rats to 0.1 mg chromium/m^3 as a 3:2 mixture of chromium (VI) and chromium (III) oxides, however, resulted in increased red and white blood cell counts, hemoglobin content, and hematocrit. No hematological effects were observed in rats exposed orally to chromium compounds. It is possible that inhalation, oral and dermal exposure to chromium compounds at hazardous waste sites could change the hematological profiles of humans (ATSDR, 1992).

The production of chromium compounds does not appear to be associated with liver effects. Some workers in a chromate production plant had hepatobiliary disorders, and slight impairment was found in liver function testing in a few cases. These disorders could not be attributed solely to chromate exposure. However, liver effects, such as jaundice, increased bilirubin, increased levels of serum lactic dehydrogenate, and necrosis have been observed in humans after ingestion of lethal doses of potassium dichromate of chromium trioxide. Only mild liver effects (increase in triglycerides and phospholipids) were observed in rats exposed to 0.2 mg chromium (VI)/m^3 as sodium dichromate for 90 days. Although liver effects in animals exposed to chromium compounds by inhalation, oral and dermal routes appear to be mild, studies in which animals were exposed by other routes indicate more serious effects, i.e., subcutaneously or intraperitoneally. While these studies indicate that the liver is a target organ of chromium toxicity in animals, the method of administration are not predictive of effects or doses by environmentally relevant routes. Therefore, adverse liver effects are not expected to occur in humans exposed to chromium or its compounds present at hazardous waste sites. It is unlikely that oral exposure to the low levels of chromium (III) or chromium (VI) compounds detected in drinking water would cause hepatic effects in humans (ATSDR, 1992).

Renal function has been studied with equivocal results in workers occupationally exposed to chromium compounds. Some studies of workers exposed to chromium (VI) and chromium (III) in the chromate production industry have found increased levels of low molecular weight proteins indicative of liver damage. Other studies of renal function in chromate production workers found negative or inconclusive results. Severe renal impairment, renal failure, and necrosis of renal tubules have been reported in cases of fatal or near fatal ingestion of chromium (VI) compounds by humans. Acute nephritis has also been reported in cases of dermal exposure of chromium (VI) compounds. Exposure to high levels of chromium (VI) compounds by any route may result in kidney effects in humans, but it seems less likely that exposure levels at hazardous waste sites would cause renal effects in humans (ATSDR, 1992).

Chromium compounds produce effects on the skin and mucous membranes. These include irritation, burns, ulcers, and an allergic type of dermatitis. Acute dermal exposure to chromium (VI) compounds can cause skin burns. Although skin contact with chromate salts may cause rashes, the ulcers or sores (also called chrome holes) on the skin are a major problem because they can deeply penetrate the skin with prolonged exposure. In addition, irritation and ulceration of mouth structures and buccal mucosa can occur from exposure to chromium (VI) compounds. High incidences of inflammation of oral structures, keratosis of the lips, gingiva, and palate, gingivitis, and peridontis were observed in chromate production workers. Ocular effects can occur as a result of direct contact of eyes with chromium compounds. These include corneal vesication in a man who got a drop or a crystal of potassium dichromate in his eye and congestion of the conjunctiva, discharge, corneal scar, and burns in chromate production workers as a result of accidental splashes. It is possible that dermal effects could occur in humans exposed to chromium (VI) compounds at hazardous waste sites, particularly from dermal contact with contaminated soil (ATSDR, 1992).

Information regarding neurological effects after exposure to chromium or its compounds is limited. Dizziness, headache, and weakness were experienced by workers in a chrome plating plant were poor exhaust resulted in excessively high concentrations of chromium trioxide. Brain enlargement and cerebral edema were observed upon autopsy of boy who died after ingesting potassium dichromate. Furthermore, a 14-month-old girl who ate paint containing a chromite ore pigment experienced convulsions and became unconscious. Motor activity and ponderal balance decreased in rats given 98 mg chromium (VI)/kg/day as sodium chromate. It is unlikely that members of the general populations would be exposed to concentrations of chromium (VI) in air or drinking water high enough to cause neurological effects (ATSDR, 1992).

The only information regarding developmental effects of chromium exposure in humans is that female employees at dichromate manufacturing factories in Russia had greater incidences of complications during pregnancy and childbirth, toxicosis during pregnancy, and post-natal hemorrhage than did controls. Chromium (VI) compounds caused severe developmental effects in mice after oral exposure. Effects occurred at doses > 57 mg chromium (VI)/kg/day as potassium dichromate. The results of animal studies indicate that chromium (VI) compounds are development toxicants in mice by the oral route. The possibility that concentrations of chromium (VI) compounds in drinking water at hazardous waste sites would be high enough to cause developmental effects in humans cannot be ruled out (ATSDR, 1992).

Epidemiology studies clearly indicate an increased respiratory cancer risk in chromate production workers. Increased risks of respiratory cancer are also reported in some studies of chrome pigment workers, chrome plating workers, and ferrochromium workers. The epidemiology studies do not clearly implicate specific compounds, but do implicate chromium (VI) compounds. Chromium (VI) compounds are considered to be carcinogenic for humans (ATSDR, 1992).

Regulatory Levels

Chromium (III) - Chronic RfD: oral - 1.0 mg/kg-day.
AWQC: water and fish - 170 mg/L.
fish only - 3433 mg/L.
TLV-TWA: 0.5 ppm (ACGIH, 1993-94).
Chromium (VI) - Chronic RfD: oral - 0.005 mg/kg-day.
Chronic CSF: inhalation - 42 $(mg/kg\text{-}day)^{-1}$.
AWQC: water and fish - 0.05 mg/L.
TLV-TWA: 0.5 ppm (ACGIH, 1993-94).
EPA Carcinogen Classification: Group A (known human carcinogen.
Total chromium: MCL - 0.1 mg/L (USEPA, July 1992).
Reference: IRIS, April 1994 (unless otherwise indicated).

2.3 NICKEL

General Properties

Atomic Number: 28
Atomic Weight: 58.69 g/mol
Melting Point: 1,453°C
Boiling Point: 2,732°C
Specific Density: 8.902 (@ 25°C)
Vapour Pressure: 1 mm Hg (@ 1,810°C)
Oxidation States: +1, +2, +3
Reference: Weast, 1986.

Uses

Nickel is primarily used in alloys because it imparts desirable properties such as corrosion resistance, heat resistance, hardness, and strength to a product. These alloys have a wide variety of uses, including the following: industrial plumbing, marine and petrochemical equipment, heat exchangers, pumps, electrodes for welding, coinage metal, gas-turbine engines, coatings on tableware, electrical contacts, catalyst, alloy steels, stainless steels, cast irons, and permanent magnets. Nickel salts are used in electroplating, ceramics, pigments, and as catalysts. Nickel is also used in alkaline batteries (ATSDR, 1992).

Sources

Natural: Nickel and its compounds are naturally present in the earth's crust, and releases to the atmosphere occur from natural discharges such as windblown dust, volcanoes, and vegetation. Nickel is transported into streams and waterways in runoff either due to natural weathering or from disturbed soil (ATSDR, 1992).

Anthropogenic: The burning of residual and fuel oil is responsible for the majority of anthropogenic emissions, followed by nickel metal refining, municipal incineration, steel production, other nickel alloy production, and coal combustion (ATSDR, 1992).

Environmental Concentrations

The nickel concentrations in particulate matter in the U.S. atmosphere ranged from 0.01 to 60, 0.6 to 78, and 1 to 328 ng/m^3 in remote, rural, and urban areas, respectively (ATSDR, 1992).

The nickel content of fresh surface water has been reported to average between 15 and 20 μg/L. The mean nickel concentration in 16 major river basins in the United States ranged from 3 μg/L in the Western Gulf to 56 μg/L in Lake Erie (overall mean of 9 μg/L). However, the detection frequencies ranged from 2.1% to 56%, and only detectable levels were used in calculating the means. Drinking water generally contains < 10 μg/L. Elevated nickel levels may exist in drinking water due to the corrosion of nickel-containing alloys used as valves and other components in the water distribution system as well as nickel-plated faucets (ATSDR, 1992).

Nickel occurs naturally in the earth's crust with an average concentration of 0.0086% (86 ppm). The nickel content of soil may vary depending on local geology. Typical nickel levels reported in soil range from 4 to 80 ppm. A soil survey by the U.S. Geological Survey throughout the conterminous United States reported that nickel concentrations ranged from < 5 to 700 ppm, with a geometric mean of 12 ± 2.31 ppm. Cultivated soils contain 5 to 500 ppm of nickel, with a typical concentration of 50 ppm. Nickel concentrations in Canadian soils are generally 5 to 50 ppm (ATSDR, 1992).

Environmental Fate

Terrestrial: Nickel is strongly adsorbed by soil. There are many adsorbing species in soil, and many factors affect the extent to which nickel is adsorbed, so the adsorption of nickel by soil is site specific. Most soils have an extremely high affinity for nickel and that once sorbed, nickel is difficult to desorb. An analysis of the thermodynamic stability models of various nickel minerals and solution species indicates that nickel ferrite is the solid species that will most likely precipitate in soil. Ni^{2+} and $Ni(OH)^+$ are major components of the soil solution in alkaline soils. In acid soils, the predominant solution species will probably be Ni^{2+}, $NiSO_4$, and $NiHPO_4$ (ATSDR, 1992).

Aquatic: The fate of heavy metals in aquatic systems depends on partitioning between soluble and particulate solid phases. Adsorption, precipitation, coprecipitation, and complexation are processes that affect partitioning. Much of the nickel released into waterways as runoff is associated with particulate; it is transported and settles out in areas of active sedimentation such as the mouth of a river. In natural waters, nickel primarily exists as the hexahydrate. Precipitation can remove soluble nickel from water (ATSDR, 1992).

Atmospheric: Nickel is released to the atmosphere in the form of particulate matter or adsorbed to particulate matter. It is dispersed by wind and removed by gravitational settling, dry deposition, washout by rain, and rainout. Removal of coarse particules may occur in a matter of hours. Very small particles may have an atmospheric half-life as long as 30 days and may, therefore, be transported over long distances (ATSDR, 1992).

Absorption, Metabolism and Excretion

In humans, ≈ 35% of inhaled nickel is absorbed into the blood from the respiratory tract. The remainder is either swallowed or expectorated. Absorption studies in humans report that 40 times more nickel was absorbed from the gastrointestinal tract when nickel sulphate was given in the drinking water (27%) than when it was given in food (0.7%). Several studies in humans indicate that nickel can penetrate the skin. Of the radioactive dose of nickel sulphate applied to occluded skin, 55 to 77% was absorbed within 24 hours, with most being absorbed in the first few hours. It could not be determined whether the nickel has been absorbed into the deep layers of the skin or into the bloodstream (ATSDR, 1992).

The metabolism of nickel consists of ligand exchange reactions. In human serum, nickel binds to albumin, L-histidine, and α-2-macroglobulin. Once inside the cell, nickel interacts with deoxyribonecleic acid (DNA), resulting in crosslinks and strand breaks (ATSDR, 1992).

Absorbed nickel is excreted in the urine, regardless of the route of exposure. In humans, most ingested nickel that is not absorbed is excreted in the feces (ATSDR, 1992).

Toxicity

The primary causes of death in workers exposed to nickel were nonmalignant respiratory disease and nasal and lung cancers. A child who accidentally ingested nickel sulfate (570 mg nickel/day) died from cardiac arrest. In lethality studies in animals, soluble nickel compounds were more toxic than the insoluble nickel compounds clinical signs observed prior to death from oral exposure included lethargy, ataxia, irregular breathing, cool body temperature, salivation, squinting and loose stools. Both the human and animal data indicate that it is unlikely that exposure to nickel in the environment or at hazardous waste sites will result in human deaths. Accidental exposure to high levels of nickel, however, may cause death (ATSDR, 1992).

Effects on the respiratory system of workers exposed to nickel dust included chronic bronchitis, emphysema, and reduced vital capacity. The workers, however, were also exposed to other toxic metals including uranium, lead, and chromium. Therefore, it should not be concluded that nickel was the sole causative agent (ATSDR, 1992).

No increase in numbers of deaths from cardiovascular diseases were reported in nickel workers. Changes in heart weight were observed in animals after longer-term oral exposure to nickel, but the significance of these effects is not known. For example, rats showed decreased heart weight when exposed to 8.6 mg nickel/kg/day as nickel chloride for 91 days or increased heart weight when exposed to 50 mg nickel/kg/day as nickel sulphate for 2 years. Exposure to nickel at environmental levels or at hazardous waste sites is unlikely to result in cardiovascular effects (ATSDR, 1992).

Gastrointestinal effects including nausea, cramps, diarrhea, and vomiting were reported by workers exposed to nickel at estimated doses of 7.1 to 35.7 mg/kg in a contaminated water fountain. Gastrointestinal effects also were observed in animals orally exposed to nickel at concentrations > 1.2 mg/kg/day for 91 days. These effects included discoloration of the gastrointestinal contents, ulcerative gastritis, and enteritis. Although the dose of nickel in the human study was relatively high, it indicates that exposure to low doses of nickel over time may result in gastrointestinal effects (ATSDR, 1992).

A transient increase in blood reticulocytes and serum bilirubin was observed in workers exposed to nickel in a contaminated water fountain. Hematological effects were observed in animals after either inhalation of 0.2 mg/m^3 for 28 days or > 0.8 mg/m^3 for 21 days or oral exposure of > 0.35 mg/kg/day. Overall, the results indicate that nickel exposure results in hematological effects in both humans and animals. It is unlikely, however, that exposure to environmental levels or at hazardous waste sites will result in hematological effects (ATSDR, 1992).

Muscular effects were not observed in animals exposed to nickel by any route. It is unlikely that exposure of humans to nickel in the environment or at hazardous waste sites will result in adverse muscular effects (ATSDR, 1992).

No studies were located regarding hepatic effects in humans after exposure to nickel by any route. Liver weight changes were found in animals following both inhalation (> 0.8 mg/m^3 for 21 to 28 days) and oral exposure (> 1.4 mg/kg/day for < 2 years) to nickel and liver atrophy was observed following short-term inhalation exposure to nickel subsulfide (3.6 mg/m^3 for 16 days). It is unlikely, however, that exposure of humans to nickel in the environment or at hazardous waste sites will result in hepatic effects (ATSDR, 1992).

In nickel workers, a significant association was found between nickelemia and increased levels of urinary ß-2-microglobulin. A transient increase in urine albumin was found in workers exposed to nickel in a contaminated drinking fountain. Renal tubular damage (damage to the convoluted tubules and necrosis) and nephrosis were observed in animals after oral exposure to nickel at concentrations of > 108 mg/kg/day for 180 days. Changes in kidney weight were also observed in animals after inhalation or oral exposure to nickel is possible that nickel exposure will cause renal effects in occupationally-exposed individuals. It is possible that nickel exposure will cause renal effects in occupationally-exposed individuals. It is unlikely, however, that environmental exposure or exposure at hazardous waste sites will result in renal effects (ATSDR, 1992).

Contact dermatitis, resulting from dermal exposure to nickel, is the most prevalent effect of nickel in the general population. Once an individual is sensitized, even minimal contact with nickel by any route of exposure will elicit a reaction (ATSDR, 1992).

Occupational transitory exposure to nickel in a contaminated drinking fountain caused giddiness and weariness. Loss of vision for 2 hours was found in one man following ingestion of nickel sulfate at a concentration of 0.05 mg/kg. Lethargy, ataxia, and prostration were seen following oral exposure of rats for 90 days to concentrations of > 1.2 mg/kg/day. Both the human and animal data suggest that neurological effects may result from short- or long-term exposure to nickel (ATSDR, 1992).

The carcinogenic effect of nickel has been well documented in occupationally exposed workers. The respiratory cancers were primarily related to exposure to soluble nickel compounds at > 1 mg nickel/m^3 and to exposure to less soluble compounds at > 10 mg nickel/m^3.

Regulatory Levels

Chronic RfD: oral - 0.02 mg/kg-day
Chronic CSF: inhalation - 1.19 (mg/kg-day)$^{-1}$ (SPHEM, October 1986).
MCL: 0.1 mg/L (USEPA, May 1993).
AWQC: water and fish - 1.34 x 10^{-2} mg/L
  fish only - 0.102 mg/L
TLV-TWA: 1 mg/m^3 (ACGIH, 1993-94).
EPA Carcinogen Classification: Group A (known human carcinogen)
Reference: IRIS, April 1994 (unless otherwise indicated).

2.4 ZINC

Zinc is widely distributed in nature, consisting of 0.027 percent (by weight) of the earth's crust (Merck 1983), but it is usually not found free in nature. The primary sources of Zinc in the environment are related to metallurgic wastes from smelter and refining operations. Releases to surface and groundwater are probably the greatest source of ambient Zinc. Zinc is not volatilized to any significant extent, but is primarily deposited on sediments as a result of discharge from industrial operations and weathering processes.

Environmental Fate

Zinc is released to the atmosphere as dust and fumes from Zinc production facilities. Total releases of Zinc to air account for only a small portion of the total environmental release. Volatilization does not appear to be an important process for Zinc. No estimate for the atmospheric lifetime of Zinc is available at this time. Atmospheric emissions of Zinc, consisting primarily of Zinc sorbed to submicron particulate matter and the oxide of Zinc are expected to be short-lived, due to surface deposition (EPA 1980).

In aquatic environments, sorption of Zinc is its dominant fate. Zinc partitions to sediments or suspended solids in surface waters through sorption onto hydrous iron and manganese oxides, clay minerals and organic material.

Zinc is likely to be strongly sorbed in soil. The mobility of Zinc in soil depends on the solubility of the speciated forms of the compound and on soil properties such as sorption potential, pH and salinity. No information specifically related to transformation and degradation in soil was identified in the available literature; however, chemical speciation of Zinc in soil is probably affected by the same factors affecting its fate in water.

Toxicity

Zinc concentration in soils varies from 10 to 300 mg/kg. Zinc is found in foods; protein rich foods being higher. Zinc is an essential element, necessary for the function of various enzymes. 15 mg/day has been recommended as the daily requirement for adults by the NAS, Food and Nutrition Board. Chronic poisoning from zinc ingestion has not been described in humans. Doses of 135 mg/day in human patients for up to 6 months did not cause any adverse effects (Friberg, Nordberg, and Vouk, 1986).

Zinc is not a suspect carcinogen and has an oral RfD of 0.3 mg/kg/day (IRIS, 1992).

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I

APPENDIX I

FISH AND WILDLIFE IMPACT ASSESSMENT

PHASE I

FISH AND WILDLIFE IMPACT ASSESSMENT
PHASE 1

LEICA INC.
CHEEKTOWAGA, NEW YORK

Prepared by: Fine Line Technical Services
July 1994

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FIGURE 2.2	VEGETATION COVERTYPE MAP

1.0 INTRODUCTION

A biotic survey of selected areas in the vicinity of the Leica Inc. Cheektowaga, New York (Site) was conducted during July 1994. The Site is identified on the New York State Department of Environmental Conservation Registry of Inactive Hazardous Waste Sites as Site No. 915156. The purpose of the survey was to provide a qualitative description of fish and wildlife resources that may be or may have been significantly affected by site conditions, and to provide appropriate information to support a qualitative risk assessment relative to any identified natural resources in the Site vicinity. The survey was conducted in accordance with Step I of the New York State Department of Environmental Conservation (NYSDEC) guidance document titled "Fish and Wildlife Impact Analysis for Inactive Hazardous Waste Sites", dated June 18, 1991, except as noted.

2.0 SITE DESCRIPTION

The Site is located on approximately 24 acres of land in the Town of Cheektowaga, Erie County, New York. The Site area is included in the Lake Erie drainage basin described as the "Erie-Ontario Plain". Soils of the area are deep, gently sloping to nearly level, and moderately well drained to somewhat poorly drained soils formed in glacial till. The area is located in the "Elm-Red Maple-Northern Hardwood Forest Zone" of Western New York. The character of this forest zone has been strongly influenced by historical and ongoing human activities.

Community types found on the entire Site area are "culturally" developed as industrial buildings, pavement, and mowed lawn. Likewise, major areas adjacent to the Site are developed urban land and exhibit cultural land use patterns including single and multi-family residential, mowed lawn (cemetary), and vacant urban land.

One off-site area of approximately 6 acres adjacent to the eastern boundary of the Site contains undeveloped wooded, shrub, and open land. Though this area is considered to be "natural" for the purposes of this survey, natural community structure of the area has been significantly altered by historical and on-going human disturbances.

Disturbances in this undeveloped area have included; excavation for installation of underground sewers, alterations of surface water drainage patterns, ongoing placement of soil fill material and woody debris, removal of vegetation by bush-hog, and un-authorized disposal of trash and construction/demolition debris. Evidence of historical and on-going disturbance and its location within a densely urbanized area severely limit the area's potential as a wildlife resource.

Evidence of soil disturbance resulting from the installation of underground sewer lines was observed during field reconnaissance conducted during July 1994. Evidence of this disturbance includes the presence of sidecast soil piles near manholes and adjacent to the sewer line route.

Evidence of other soil disturbance was observed as historic and ongoing placement of fill material in some areas adjacent to developed cemetary land.

Other alterations to natural conditions in the area included partial removal of woody shrub vegetation by bush hogging and unauthorized disposal of household trash, construction/demolition, and yard debris in the northern portion of the area adjacent to an un-secured gate.

Surface water drainage patterns in this low lying area are not well developed and have likely been effected by placement of fill material and surface run-off from adjacent paved areas. Indirect evidence of saturated soil conditions and temporary inundation of the area were observed as sediment deposits on vegetation, debris drift, and water stained leaves.

2.1 NATURAL RESOURCES MAP

The Natural Resources Map (Figure 2.1) indicates the location of the Site and documented fish and wildlife resources that are known to occur on and within a two mile radius of the Site perimeter. The potential presence of regulated freshwater wetland areas within a two mile radius of the Site was determined from review of New York State Department of Environmental Conservation (NYSDEC) Freshwater Wetland, and US Fish and Wildlife Service (USFWS) National Wetland Inventory maps titled "Buffalo NE, New York".

Federally jurisdictional wetlands identified in this survey include only those identified from USFWS resources. No attempt was made to identify other potentially jurisdictional areas that may occur in the survey area.

Regulated open water areas within two miles of the Site were identified from NYSDEC stream classification maps, through consultation with NYSDEC Division of Waters staff, and review of other existing agency resource information.

2.1.1 Fish and Wildlife Resources Within Two Miles of the Site

No New York State freshwater wetlands occur on the Site or in the area within two miles of the Site perimeter.

A portion of one mapped federally jurisdictional wetland associated with Scajaquada Creek occurs within two miles of the perimeter of the Site. This area is shown on Figure 2.1 Natural Resources Map and is identified as exhibiting; palustrine, forested, broad leaf deciduous, seasonally saturated, and; palustrine scrub/shrub, broad leaf deciduous, seasonally saturated conditions. Contact with the US Army Corps of Engineers, Buffalo District indicates that portions of this wetland have been altered as the result of commercial develpoment.

The area within two miles of the Site perimeter contains channelized open water and culverted underground portions of Scajaquada Creek. Scajaquada Creek is a tributary of Lake Erie and is identified by NYSDEC as Waters Index Number O-158-15. All portions of this stream within a two mile radius of the Site are identified as Class C Standard C.

NYSDEC "Water Quality Regulations" (NYS, CRR Title 6, Chapter 10, Parts 700-705) describe Class C surface waters by suitability for use:

> "The best usage of Class C waters is fishing. These waters shall be suitable for fish propagation and survival. The water quality shall be suitable for primary and secondary contact recreation, although other factors may limit the use for these purposes."

2.1.2 Fish and Wildlife Resources More than Two Miles From the Site

Information from the New York State Department of Environmental Conservation Natural Heritage Program indicates that two Natural Heritage Sites occur within <u>five</u> (5) miles of the Site. Historical observations from these locations have indicated the occurrence of Stiff-leaf Goldenrod (<u>Solidago rigida</u>) and Clinton's Clubrush (<u>Scirpus clintonii</u>). These two plant species are considered to be "threatened" and "endangered" respectively. These species were not observed on the Site or in the Site vicinity during field reconnaissance conducted during July, 1994.

Due to the nature and extent of known contamination, natural resources existing more than two miles downstream of the Site area are not likely to be affected by Site related conditions or activities.

2.2 VEGETATION COVERTYPE MAPPING

The Vegetation Covertype Map presented as Figure 2.2 indicates general vegetation covertypes and locations of field survey observation points in the undeveloped off-site area adjacent to the Site. The map was prepared from interpretation of aerial photographs and observations made during field reconnaissance conducted during July 1994. Field data sheets and photographs for each observation point are presented in Appendix B.

Mapping units for the Vegetation Covertype Map are based upon community types described by the dominant vegetation type observed during field reconnaissance. Due to the nature and extent of physical site disturbances, vegetation covertypes in the area do not conform closely to descriptions and classifications used by the New York Natural Heritage Program (Reschke, 1990). It should be noted that covertype boundary locations are based on interpretation of recent aerial photographs and are approximate.

3.0 FISH AND WILDLIFE RESOURCES

Due to the disturbed nature of the 6 acre off-site area vegetation covertypes observed do not conform entirely with natural covertypes described by the Natural Heritage Program. Potential wildlife resources in the vicinity of the Site are limited to the 6 acre area adjacent to the Site. As noted above this relatively small area has been both significantly disturbed and is surrounded by urban land.

No unique covertypes, not described by the Natural Heritage Program, were identified through review of agency resource information or during field reconnaisance. The following describes potential wildlife resources that occur within the 6 acre off-site area.

3.1 Open Field

Areas of the off-site area containing fill piles and recently graded fill areas exhibit mixed covertypes composed of species typical of disturbed land and successional open field communities. Vegetation of these areas is dominated by shrubs, grasses and forbs. Shrub and tree species present comprise less than fifty percent of cover. Many of the plant species found in the area are opportunistic non-native species that can tolerate poor soil conditions characteristic of disturbed soils. Though not dominated by hydrophytic vegetation, wetland plant species occur in poorly drained locations that may be temporarily impounded due to the placement of fill material. Plant species characteristic of these areas are presented below:

Common Name	Scientific Name
Shrubs	
Eastern Cottonwood	*Populus deltoides*
Quaking Aspen	*Populus tremula*

Open Field (Cont.)

Herbs

Spreading Dogbane	*Apocynum androsaemifolium*
Tall Goldenrod	*Solidago altissima*
Grass-leaved Goldenrod	*Euthamia graminifolia*
Rough Cinquefoil	*Potentila recta*
Wild Strawberry	*Fragaria virginiana*
Queen Anns Lace	*Daucus carota*
Red Clover	*Trifolium pratense*
Timothy	*Phleum pratense*
Red Top	*Agrostis alba*
Broadleaf Cattail	*Typha latifolia*
Rough Avens	*Geum laciniatum*
Teasle	*Dipsacus sylvestris*
Common Milkweed	*Asclepius syriaca*
Curly Dock	*Rumex crispus*
Sow Thistle	*Sonchus arvensis*
Jerusalem Artichoke	*Helianthus tuberosus*
Black Mustard	*Brassica nigra*
Evening Primrose	*Oenothera biennis*
Field Bindweed	*Convulvus arvensis*
Daisy Fleabane	*Erigeron annuus*
Field Horsetail	*Equisetum arvense*
Dandelion	*Taraxicum officinale*
Common Burdock	*Arctium minus*

3.2 Shrubland

Conditions characteristic of successional shrubland communities occur in locations that may have been filled but have not been subjected to recent soil disturbance. Observations made during July 1994 field reconnaissance indicate that vegetation of these areas has been partially removed by "bush- hogging".

This community type is broadly defined and is often a transitional stage between old field and wooded communities. Successional shrublands are typified by covertypes containing more than fifty percent shrub species and less than fifty percent trees. Plant species representative of successional shrubland in the off-site area adjacent to the Site are presented below:

Common Name	Scientific Name
Trees	
Eastern Cottonwood	*Populus deltoides*
Green Ash	*Fraxinus pennsylvanica*
Shrubs	
Gray-stemmed Dogwood	*Cornus foemina*
Green Ash	*Fraxinus pennsylvanica*
Herbs	
Tall Goldenrod	*Solidago altissima*
Grass-leaved Goldenrod	*Euthania graminifolia*
Wild Strawberry	*Fragaria virginiana*
Rough Avens	*Geum laciniatum*
Rough Cinquefoil	*Potentilla recta*
Common Cinquefoil	*Potentilla simplex*
Red Top	*Agrostis alba*
Queen Anns Lace	*Daucus carota*
Timothy	*Phleum pratense*
Cow vetch	*Vicia cracca*
Moneywort	*Lysimachia nummularia*
Soft Rush	*Juncus effusus*
Broadleaf Cattail	*Typha latifolia*
Woolgrass	*Scirpus cyperinus*
Bristlebract Sedge	*Carex tribuloides*
Tussock Sedge	*Carex stricta*
Wild Onion	*Allium vineale*

3.3 Woodland

The wooded portion of the undeveloped off-site area includes mixed tree species typical of both successional northern hardwood forest and forested wetland communities found through out much of Western New York. It is likely that this mixed community composition is the result of soil disturbances coupled with poor drainage and the potential for frequent temporary inundation. The dominant tree species of the wooded area is Black Willow *(Salix nigra)*, typical of wetland conditions. Other tree species include sun-tolerant species with wind dispersed seeds which are adapted to survive on disturbed soils. Likewise the shrub and herb strata include mixed upland and facultative hydrophytic species characteristic of successional shrub communities. Herbs present include species typical of successional old field conditions as well as pioneering plants typical of recently disturbed soils. Plant species characteristic of the wooded undeveloped off-site area are presented below:

Common Name	Scientific Name
Trees	
Black Willow	*Salix nigra*
Eastern Cottonwood	*Populus deltoides*
Red Maple	*Acer rubrum*
Hawthorn	*Crataegus spp.*
Shrubs	
Silky Dogwood	*Cornus amomum*
Gray-stemmed Dogwood	*Cornus foemina*
Red-osier Dogwood	*Cornus stolonifera*
Honeysuckle	*Lonicera tartarica*
Grape	*Vitis riparia*

Woodland (Cont.)

Herbs

Tall Goldenrod	*Solidago altissima*
Narrow-leaf Goldenrod	*Euthamia graminifolia*
Aster species	*Aster* spp.
Moneywort	*Lysimachia nummularia*
Wild Strawberry	*Fragaria virginiana*
Rough Avens	*Geum laciniatum*
Daisy Fleabane	*Erigeron annuus*
Wild Onion	*Allium vineale*
Curly Dock	*Rumex crispus*
Common Plantain	*Plantago major*
Dandelion	*Taraxicum officinale*
Common Burdock	*Arctium minus*
Field Bindweed	*Convulvus arvensis*
Ragweed	*Ambrosia artemisiifolia*
Day Lily	*Hemerocallis fulva*
Jerusalem Artichoke	*Helianthus tuberosus*
Common Milkweed	*Asclepias syriaca*
Queen Anne's Lace	*Daucus carota*

4.0 FAUNA EXPECTED WITHIN EACH COVERTYPE

Wildlife species that may be associated with habitats within the vicinity of the Site were determined through review of NYSDEC file information, standard natural history references, and from observations made during field reconnaissance. NYSDEC information sources included, Region 9 Bureau of Wildlife, and the New York Natural Heritage Program, Wildlife Resources Center. No aquatic habitat was observed or has been mapped within the Site vicinity. Agency correspondence is contained in Appendix A. References used are presented in Appendix C.

All covertypes in the off-site area can be considered to be terrestrial, these covertypes include: wooded, shrub, and open land. Wildlife species that can be expected to utilize these covertypes, in this location, are limited to those species that can tolerate human presence and site resident species that do not require a large territorial range to complete their life cycles. Due to past and on-going disturbances and the dominantly urbanized land use patterns of surrounding areas, the potential for utilization of the area by large mammals is limited.

Due to the small area available for utilization, the wildlife species that can be expected to occur in the off-site area are limited. Species listed below can be expected to utilize all vegetative covertypes of the area during some part of the year. Wildlife species potentially utilizing this area could include:

Common Name	Scientific Name	NY State Protective Status
	Birds	
American Crow	*Corvus brachyrhynchos*	Game species
Black-capped Chickadee	*Parus atricapillus*	Protected
American Robin	*Turdus migratorius*	Protected
Mourning Dove	*Zenaida macroura*	Protected
Mockingbird	*Mimus polyglottos*	Protected
House Sparrow	*Passer domesticus*	Protected
Comon Grackle	Quiscalus Quiscula	Protected
	Mammals	
Gray Squirrel	*Sciurus carolinensis*	Game species
Raccoon	*Procyon lotor*	Game species
Eastern Cottontail Rabbit	*Sylvilagus floridanus*	Game species
Norway Rat	*Rattus norvegicus*	Unprotected
House Mouse	*Mus musculus*	Unprotected
Deer Mouse	*Peromyscus maniculatus*	Unprotected
Meadow Vole	*Microtus pennsylvanicus*	Unprotected
	Amphibians/Reptiles	
American Toad	*Buffo americanus*	Unprotected
Rat Snake	*Elaphe obsoleta*	Unprotected

5.0 SITE RELATED EFFECTS

No obviously contaminated areas were observed on the Site or in the area within the Site vicinity. No stressed vegetation, wildlife mortality, or other abnormal changes in biota were observed. No records of wildlife mortality associated with the Site area were found during review of file information by NYSDEC Region 9 Staff.

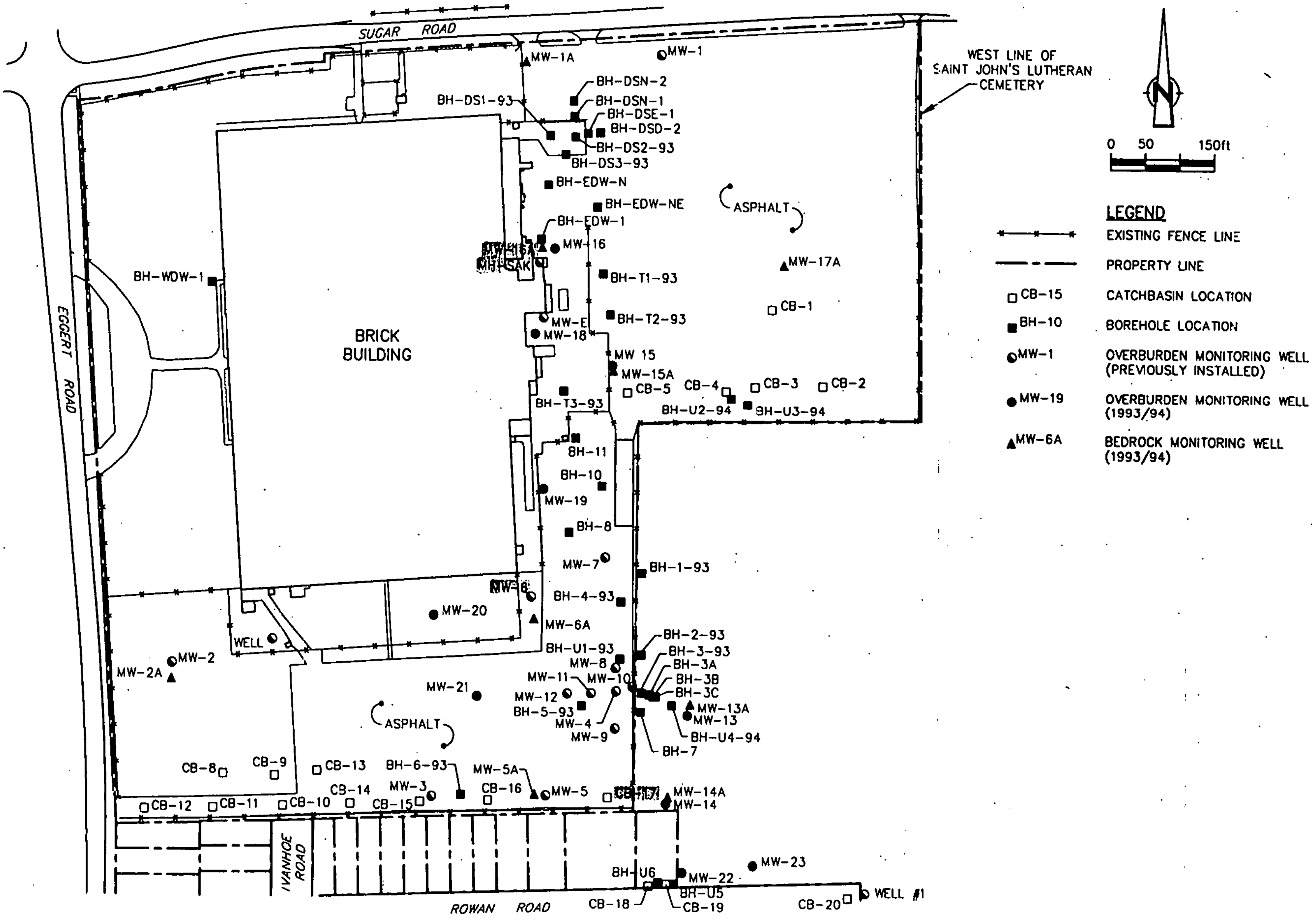
6.0 FISH AND WILDLIFE RESOURCE VALUES

6.1 VALUE OF HABITATS TO WILDLIFE

The wildlife resources in the vicinity of the Site have been largely influenced by development of the Site and surrounding areas for residential and industrial uses. The limited area of undeveloped land adjacent to the Site appears to be influenced by historical and on-going physical disturbances. As a result, wildlife species that can be expected to utilize the area are common species that are adaptable to culturally influenced conditions. There are no known rare, threatened, or endangered species in the Site area, nor are there any unusual or exemplary ecological communities present.

6.2 VALUE OF RESOURCES TO HUMANS

Natural resources in the Site vicinity have limited recreational or economic value to humans. Current and potential economic activities of the area are not dependant on natural resources. It is likely that currently proposed expansion of adjacent cemetary holdings represents a suitable use of the area.



SOURCE: GARY E. KRULL, LAND SURVEYOR
11651 WHITETAIL DRIVE
MARILLA, NEW YORK 14102
(716) 655-1654

CRA

figure ?

BASE PLAN
LEICA INC.
Cheektowaga, New York

3967 (BASE) SEPT 08/94(W) REV.0 (B-04)

DETAILED FIELD DATA SHEET

PROJECT:	LEICA INCORPORATED	**DATE:**	7/8/94
PROJ. LOCATION	CHEEKTOWAGA, NEW YORK	**CREW:**	M A LINDBERG
VEG. COVER:	WOODED	**PHOTO NO.**	953
OBS POINT	OBSERVATION POINT NO. 1	**FACING:**	EAST

VEGETATION

SPECIES	STRATA	% COVER
SALIX NIGRA	T	80
CRATAEGUS SPP.	T	20
CORNUS FOEMINA	S	30
CORNUS AMOMUM	S	5
VITIS RIPARIA	S	5
FRAXINUS PENNSYLVANICA	T/S	5
FRAGARIA VIRGINIANA	H	10
GEUM LACINIATUM	H	20
ASTER SPP.	H	10
LYSIMACHIA NUMMULARIA	H	30
ERIGERON ANNUUS	H	5
ALLIUM VINEALE	H	5

HYDROLOGY

STAINED LEAVES	X	**BUTTRESSING**	X
SED. DEPOSITS	X	**ADV. ROOTS**	X
WATER MARKS:	X	**DEBRIS DRIFT**	X
TOPOGRAPHY	X	**INUNDATED**	NO
OTHER	DEPRESSIONS/POOLS		

WILDLIFE

OBSERVED:

TRACKS/SCAT *SYLVILAGUS FLORIDANUS*

COMMENTS:

DETAILED FIELD DATA SHEET

PROJECT:	LEICA INCORPORATED	**DATE:**	7/8/94
PROJ. LOCATION	CHEEKTOWAGA, NEW YORK	**CREW:**	M A LINDBERG
VEG. COVER:	WOODED	**PHOTO NO.**	956
OBS POINT	OBSERVATION POINT NO. 2	**FACING:**	EAST

VEGETATION

SPECIES	STRATA	% COVER
SALIX NIGRA	T	60
CORNUS FOEMINA	S	10
LONICERA TATARICA	S	5
VITIS RIPARIA	S	5
SOLIDAGO ALTISSIMA	H	5
LYSIMACHIA NUMMULARIA	H	15
ERIGERON ANNUUS	H	5
RUMEX CRISPUS	H	5
PLANTAGO MAJOR	H	10
ARCTIUM MINUS	H	10
CONVOLVULUS ARVENSIS	H	5
TARAXACUM OFFICINALE	H	5

HYDROLOGY

STAINED LEAVES		**BUTTRESSING**	
SED. DEPOSITS		**ADV. ROOTS**	
WATER MARKS:		**DEBRIS DRIFT**	
TOPOGRAPHY		**INUNDATED**	NO
OTHER			

WILDLIFE

OBSERVED:

TRACKS/SCAT

COMMENTS: FILL MATERIAL INCLUDING: SOIL, BRICKS, WOODY DEBRIS, AND TRASH.

DETAILED FIELD DATA SHEET

PROJECT:	LEICA INCORPORATED	**DATE:**	7/8/94
PROJ. LOCATION	CHEEKTOWAGA, NEW YORK	**CREW:**	M A LINDBERG
VEG. COVER	OPEN FIELD	**PHOTO NO.**	1001
OBS POINT	OBSERVATION POINT NO. 3	**FACING:**	EAST

VEGETATION

SPECIES	STRATA	% COVER
POPULUS DELTOIDES	T/S	5
SOLIDAGO ALTISSIMA	H	10
DIPSACUS SYLVESTRIS	H	10
HELIANTHUS TUBEROSUS	H	5
RUMEX CRISPUS	H	5
SONCHUS ASPER	H	10
DAUCUS CAROTA	H	10
TRIFOLIUM PRATENSE	H	10
BRASSICA NIGRA	H	10
OENOTHERA BIENNIS	H	5
CONVOLVULUS ARVENSIS	H	5
ERIGERON ANNUUS	H	5

HYDROLOGY

STAINED LEAVES		**BUTTRESSING**	
SED. DEPOSITS		**ADV. ROOTS**	
WATER MARKS:		**DEBRIS DRIFT**	
TOPOGRAPHY		**INUNDATED**	NO
OTHER	NONE		

WILDLIFE

OBSERVED: *CORVUS BRACHYRHYNCHOS*
TRACKS/SCAT

COMMENTS: AREA HAS BEEN AND IS CURRENTLY BEING FILLED. FILL MATERIAL APPEARS TO BE 4+ FT ABOVE NATURAL GRADE. FILL INCLUDES SOIL AND BROKEN CONCRETE.

DETAILED FIELD DATA SHEET

PROJECT: LEICA INCORPORATED
PROJ. LOCATION CHEEKTOWAGA, NEW YORK
VEG.COVER WOODED
OBS POINT OBSERVATION POINT NO. 4
DATE: 7/8/94
CREW: M A LINDBERG
PHOTO NO. 1038
FACING: WEST

VEGETATION

SPECIES	STRATA	% COVER
SALIX NIGRA	T	30
ACER RUBRUM	T	20
POPULUS DELTOIDES	T	20
LONICERA TATARICA	S	5
CORNUS FOEMINA	S	30
CORNUS STOLONIFERA	S	5
GEUM LACINIATUM	H	20
ASTER SPP.	H	10
LYSIMACHIA NUMMULARIA	H	30
ALLIUM VINEALE	H	5

HYDROLOGY

STAINED LEAVES	X	**BUTTRESSING**	X
SED. DEPOSITS		**ADV. ROOTS**	X
WATER MARKS:	X	**DEBRIS DRIFT**	
TOPOGRAPHY	X	**INUNDATED**	POOLED WATEF
OTHER			

WILDLIFE

OBSERVED: *STURNUS VULGARIS, PASSER DOMESTICUS*

TRACKS/SCAT

COMMENTS: DISCARDED MATERIAL INCLUDING: TIRES, HOUSEHOLD FURNITURE, AND TRASH.

DETAILED FIELD DATA SHEET

PROJECT: LEICA INCORPORATED

PROJ. LOCATION CHEEKTOWAGA, NEW YORK

VEG. COVER WOODED

OBS POINT OBSERVATION POINT NO. 5

DATE: 7/8/94

CREW: M A LINDBERG

PHOTO NO. 1028

FACING: SW

VEGETATION

SPECIES	STRATA	% COVER
POPULUS DELTOIDES	T	30
SALIX NIGRA	T	20
FRAXINUS PENNSYLVANICA	T	10
CORNUS FOEMINA	S	20
LONICERA TATARICA	S	20
VITIS VULPINA	S	10
LYSIMACHIA NUMMULARIA	H	30
GEUM LACINIATUM	H	20
ASTER SPP.	H	10
ALIUM VINEALE	H	5
ASTER SPP.	H	5

HYDROLOGY

STAINED LEAVES

SED. DEPOSITS

BUTTRESSING

ADV. ROOTS

WATER MARKS:

DEBRIS DRIFT

TOPOGRAPHY

INUNDATED NO

OTHER

WILDLIFE

OBSERVED: *TURDUS MIGRATORIUS*

TRACKS/SCAT

COMMENTS: AREA HAS BEEN PARTIALLY FILLED

DETAILED FIELD DATA SHEET

PROJECT: LEICA INCORPORATED

DATE: 7/8/94

PROJ. LOCATION CHEEKTOWAGA, NEW YORK

CREW: M A LINDBERG

VEG. COVER SHRUB

PHOTO NO. 1017

OBS POINT OBSERVATION POINT NO. 6

FACING: EAST

VEGETATION

SPECIES	STRATA	% COVER
POPULUS DELTOIDES	S	40
CORNUS FOEMINA	S	20
FRAXINUS PENNSYLVANICA	S	5
DIPSACUS SYLVESTRIS	H	10
SOLIDAGO ALTISSIMA	H	15
EUTHANIA GRAMINIFOLIA	H	5
FRAGARIA VIRGINIANA	H	10
GEUM LACINIATUM	H	5
POTENTILLA RECTA	H	5
AGROSTIS ALBA	H	10
PHLEUM PRATENSE	H	5
VICIA CRACCA	H	5
CAREX SPP.	H	10
DAUCUS CAROTA	H	5

HYDROLOGY

STAINED LEAVES
SED. DEPOSITS
WATER MARKS:
TOPOGRAPHY
OTHER

BUTTRESSING
ADV. ROOTS
DEBRIS DRIFT
INUNDATED NO

WILDLIFE

OBSERVED:
TRACKS/SCAT *PROCYON LOTOR*

COMMENTS: BUSH-HOGGED

DETAILED FIELD DATA SHEET

PROJECT: LEICA INCORPORATED
PROJ. LOCATION CHEEKTOWAGA, NEW YORK
VEG. COVER WOODED/CLEARED
OBS POINT OBSERVATION POINT NO. 7

DATE: 7/8/94
CREW: M A LINDBERG
PHOTO NO. 1051
FACING: NORTHWEST

VEGETATION

SPECIES	STRATA	% COVER
POPULUS DELTOIDES	T	15
FRAXINUS PENNSYLVANICA	T/S	10
CORNUS FOEMINA	S	10
LYSIMACHIA NUMMULARIA	H	30
AMBROSIA ARTEMISIIFOLIA	H	10
HEMEROCALLIS FULVA	H	5
HELIANTHUS TUBEROSUS	H	5
ASCLEPIUS SYRIACA	H	5
DAUCUS CAROTA	H	5
ALLIUM VINEALE	H	5

HYDROLOGY

STAINED LEAVES	X	**BUTTRESSING**	
SED. DEPOSITS		**ADV. ROOTS**	
WATER MARKS:	X	**DEBRIS DRIFT**	X
TOPOGRAPHY	XX	**INUNDATED**	NO
OTHER	DEPRESSIONS/POOLS		

WILDLIFE

OBSERVED:

TRACKS/SCAT *PROCYON LOTOR*

COMMENTS:

DETAILED FIELD DATA SHEET

PROJECT:	LEICA INCORPORATED	**DATE:**	7/8/94
PROJ. LOCATION	CHEEKTOWAGA, NEW YORK	**CREW:**	M A LINDBERG
VEG. COVER	WOODED	**PHOTO NO.**	1100
OBS POINT	OBSERVATION POINT NO. 8	**FACING:**	WEST

VEGETATION

SPECIES	STRATA	% COVER
POPULUS DELTOIDES	T	15
SALIX NIGRA	T	15
POPULUS TRMULA	T	10
CORNUS FOEMINA	S	5
LYSIMACHIA NUMMULARIA	H	30
ALLIUM VINEALE	H	10

HYDROLOGY

STAINED LEAVES	X	**BUTTRESSING**	
SED. DEPOSITS	X	**ADV. ROOTS**	
WATER MARKS:	X	**DEBRIS DRIFT**	X
TOPOGRAPHY	X	**INUNDATED**	
OTHER	WATER IMPOUNDED BY FILL		

WILDLIFE

OBSERVED: *QUISCALUS QUISCULA*

TRACKS/SCAT

COMMENTS: AREA HAS BEEN BUSH HOGGED

DETAILED FIELD DATA SHEET

PROJECT:	LEICA INCORPORATED	**DATE:**	7/8/94
PROJ. LOCATION	CHEEKTOWAGA, NEW YORK	**CREW:**	M A LINDBERG
VEG, COVER	SHRUB/HERBACEOUS	**PHOTO NO.**	1104
OBS POINT	OBSERVATION POINT NO. 9	**FACING:**	NORTHWEST

VEGETATION

SPECIES	STRATA	% COVER
POPULUS DELTOIDES	S	15
FRAXINUS PENNSYLVANICA	S	10
JUNCUS EFFUSUS	H	20
TYPHA LATIFOLIA	H	10
LYSIMACHIA NUMMULARIA	H	5
EUTHANIA GRAMINIFOLIA	H	10
SCIRPUS CYPERINUS	H	5
CAREX TRIBULOIDES	H	5
CAREX STRICTA	H	5

AGROSTIS ALBA	H	5
GEUM LACINIATUM	H	5
ALLIUM VINEALE	H	5

HYDROLOGY

STAINED LEAVES	X	**BUTTRESSING**	
SED. DEPOSITS		**ADV. ROOTS**	
WATER MARKS:	X	**DEBRIS DRIFT**	
TOPOGRAPHY	X	**INUNDATED**	X
OTHER	WATER IMPOUNDED BY FILL		

WILDLIFE

OBSERVED:

TRACKS/SCAT

COMMENTS:

DETAILED FIELD DATA SHEET

PROJECT:	LEICA INCORPORATED	**DATE:**	7/8/94
PROJ. LOCATION	CHEEKTOWAGA, NEW YORK	**CREW:**	M A LINDBERG
VEG. COVER	WOODED/SHRUB	**PHOTO NO.**	1055
OBS POINT	OBSERVATION POINT NO. 10	**FACING:**	EAST

VEGETATION

SPECIES	**STRATA**	**% COVER**
SALIX NIGRA	T	30
FRAXINUS PENNSYLVANICA	T	20
CORNUS FOEMINA	S	15
VITIS RIPARIA	S	5
LYSIMACHIA NUMMULARIA	H	15
GEUM LACINIATUM	H	5

FRAGARIA VIRGINIANA	H	5
ALLIUM VINEALE	H	5

HYDROLOGY

STAINED LEAVES		**BUTTRESSING**	
SED. DEPOSITS		**ADV. ROOTS**	
WATER MARKS:		**DEBRIS DRIFT**	
TOPOGRAPHY		**INUNDATED**	NO
OTHER			

WILDLIFE

OBSERVED:

TRACKS/SCAT

COMMENTS: BUSH HOGGED

DETAILED FIELD DATA SHEET

PROJECT:	LEICA INCORPORATED	**DATE:**	7/8/94
PROJ. LOCATION	CHEEKTOWAGA, NEW YORK	**CREW:**	M A LINDBERG
VEG. COVER	WOODED	**PHOTO NO.**	1111
OBS POINT	OBSERVATION POINT NO. 11	**FACING:**	NORTHWEST

VEGETATION

SPECIES	STRATA	% COVER
SALIX NIGRA	T	40
FRAXINUS PENNSYLVANICA	T	15
ACER RUBRUM	T	10

POPULUS TREMULA	T	5
LONICERA TATARICA	S	10
LYSIMACHIA NUMMULARIA	H	20
ALLIUM VINEALE	H	5
SOLIDAGO ALTISSIMA	H	5
HEMEROCALLIS FULVA	H	5
DAUCUS CAROTA	H	5

HYDROLOGY

STAINED LEAVES X
SED. DEPOSITS X
WATER MARKS: X
TOPOGRAPHY X
OTHER WATER IMPOUNDED BY FILL

BUTTRESSING
ADV. ROOTS
DEBRIS DRIFT
INUNDATED

WILDLIFE

OBSERVED:
TRACKS/SCAT

COMMENTS: BUSH HOGGED, FILL PILES

DETAILED FIELD DATA SHEET

PROJECT: LEICA INCORPORATED
PROJ. LOCATION CHEEKTOWAGA, NEW YORK
VEG. COVER OPEN FIELD
OBS POINT OBSERVATION POINT NO. 12

DATE: 7/8/94
CREW: M A LINDBERG
PHOTO NO. 1108
FACING: EAST

VEGETATION

SPECIES	STRATA	% COVER

POPULUS DELTOIDES	T/S	10
POPULUS TREMULA	T/S	5
SOLIDAGO ALTISSIMA	H	15
EUTHANIA GRAMINIFOLIA	H	5
DIPSACUS SYLVESTRIS	H	5
EQUISETUM ARVENSE	H	10
TARAXACUM OFFICINALE	H	5
APOCYNUM ANDROSAEMIFOLIUM	H	5
FRAGARIA VIRGINIANA	H	5
ARCTIUM MINUS	H	5
TRIFOLIUM PRATENSE	H	5
PHLEUM PRATENSE	H	5
POTENTILLA RECTA	H	5
SONCHUS ARVENSIS	H	5
ASCLEPIAS SYRIACA	H	5

HYDROLOGY

STAINED LEAVES
SED. DEPOSITS
WATER MARKS:
TOPOGRAPHY
OTHER

BUTTRESSING
ADV. ROOTS
DEBRIS DRIFT
INUNDATED NO

WILDLIFE

OBSERVED:
TRACKS/SCAT

COMMENTS: AREA HAS BEEN FILLED AND GRADED

DETAILED FIELD DATA SHEET

PROJECT: LEICA INCORPORATED
PROJ. LOCATION CHEEKTOWAGA, NEW YORK
COMMUNITY:
OBS POINT

DATE: 7/8/94
CREW: M A LINDBERG
PHOTO NO.
FACING:

VEGETATION

SPECIES	STRATA	% COVER

HYDROLOGY

STAINED LEAVES ______________________
SED. DEPOSITS ______________________
WATER MARKS: ______________________
TOPOGRAPHY ______________________
OTHER ______________________

BUTTRESSING ____________
ADV. ROOTS ____________
DEBRIS DRIFT ____________
INUNDATED ____________

WILDLIFE

OBSERVED: ____
TRACKS/SCAT ____

COMMENTS: ____

DETAILED FIELD DATA SHEET

PROJECT: LEICA INCORPORATED
PROJ. LOCATION CHEEKTOWAGA, NEW YORK
VEG. COVER: WOODED
OBS POINT TRANSECT 1 NO. 1

DATE: 7/8/94
CREW: M A LINDBERG
PHOTO NO. 951
FACING: EAST

VEGETATION

SPECIES	STRATA	% COVER
SALIX NIGRA	T	80
CRATAEGUS SPP.	T	20
CORNUS FOEMINA	S	30
CORNUS AMOMUM	S	5
VITIS RIPARIA	S	5
FRAXINUS PENNSYLVANICA	T/S	5
FRAGARIA VIRGINIANA	H	10
GEUM LACINIATUM	H	20
ASTER SPP.	H	10
LYSIMACHIA NUMMULARIA	H	30
ERIGERON ANNUUS	H	5
ALLIUM VINEALE	H	5

HYDROLOGY

STAINED LEAVES X
SED. DEPOSITS X
WATER MARKS: X
TOPOGRAPHY X
OTHER DEPRESSIONS/POOLS

BUTTRESSING X
ADV. ROOTS X
DEBRIS DRIFT X
INUNDATED NO

WILDLIFE

OBSERVED:
TRACKS/SCAT *SYLVILAGUS FLORIDANUS*

COMMENTS:

DETAILED FIELD DATA SHEET

PROJECT: LEICA INCORPORATED
PROJ. LOCATION CHEEKTOWAGA, NEW YORK
VEG. COVER: WOODED
OBS POINT TRANSECT 1 NO. 2

DATE: 7/8/94
CREW: M A LINDBERG
PHOTO NO. 956
FACING: EAST

VEGETATION

SPECIES	STRATA	% COVER
SALIX NIGRA	T	60
CORNUS FOEMINA	S	10
LONICERA TATARICA	S	5
VITIS RIPARIA	S	5
SOLIDAGO ALTISSIMA	H	5
LYSIMACHIA NUMMULARIA	H	15
ERIGERON ANNUUS	H	5
RUMEX CRISPUS	H	5
PLANTAGO MAJOR	H	10
ARCTIUM MINUS	H	10
CONVOLVULUS ARVENSIS	H	5
TARAXACUM OFFICINALE	H	5

HYDROLOGY

STAINED LEAVES
SED. DEPOSITS
WATER MARKS:
TOPOGRAPHY
OTHER

BUTTRESSING
ADV. ROOTS
DEBRIS DRIFT
INUNDATED NO

WILDLIFE

OBSERVED:
TRACKS/SCAT

COMMENTS: FILL MATERIAL INCLUDING: SOIL, BRICKS, WOODY DEBRIS, AND TRASH.

DETAILED FIELD DATA SHEET

PROJECT: LEICA INCORPORATED
PROJ. LOCATION CHEEKTOWAGA, NEW YORK
VEG. COVER OPEN FIELD
OBS POINT TRANSECT 1 NO. 3
DATE: 7/8/94
CREW: M A LINDBERG
PHOTO NO. 1001
FACING: EAST

VEGETATION

SPECIES	STRATA	% COVER
POPULUS DELTOIDES	T/S	5
SOLIDAGO ALTISSIMA	H	10
DIPSACUS SYLVESTRIS	H	10
HELIANTHUS TUBEROSUS	H	5
RUMEX CRISPUS	H	5
SONCHUS ASPER	H	10
DAUCUS CAROTA	H	10
TRIFOLIUM PRATENSE	H	10
BRASSICA NIGRA	H	10
OENOTHERA BIENNIS	H	5
CONVOLVULUS ARVENSIS	H	5
ERIGERON ANNUUS	H	5

HYDROLOGY

STAINED LEAVES
SED. DEPOSITS
WATER MARKS:
TOPOGRAPHY
OTHER NONE
BUTTRESSING
ADV. ROOTS
DEBRIS DRIFT
INUNDATED NO

WILDLIFE

OBSERVED: *CORVUS BRACHYRHYNCHOS*
TRACKS/SCAT

COMMENTS: AREA HAS BEEN AND IS CURRENTLY BEING FILLED. FILL MATERIAL APPEARS TO BE 4+ FT ABOVE NATURAL GRADE. FILL INCLUDES SOIL AND BROKEN CONCRETE.

DETAILED FIELD DATA SHEET

PROJECT:	LEICA INCORPORATED	**DATE:**	7/8/94
PROJ. LOCATION	CHEEKTOWAGA, NEW YORK	**CREW:**	M A LINDBERG
VEG.COVER	WOODED	**PHOTO NO.**	1038
OBS POINT	TRANSECT 2 NO. 4	**FACING:**	WEST

VEGETATION

SPECIES	STRATA	% COVER
SALIX NIGRA	T	30
ACER RUBRUM	T	20
POPULUS DELTOIDES	T	20
LONICERA TATARICA	S	5
CORNUS FOEMINA	S	30
CORNUS STOLONIFERA	S	5
GEUM LACINIATUM	H	20
ASTER SPP.	H	10
LYSIMACHIA NUMMULARIA	H	30
ALLIUM VINEALE	H	5

HYDROLOGY

STAINED LEAVES	X	**BUTTRESSING**	X
SED. DEPOSITS		**ADV. ROOTS**	X
WATER MARKS:	X	**DEBRIS DRIFT**	
TOPOGRAPHY	X	**INUNDATED**	POOLED WATEF
OTHER			

WILDLIFE

OBSERVED: *STURNUS VULGARIS, PASSER DOMESTICUS*
TRACKS/SCAT

COMMENTS: DISCARDED MATERIAL INCLUDING: TIRES, HOUSEHOLD FURNITURE, AND TRASH.

DETAILED FIELD DATA SHEET

PROJECT:	LEICA INCORPORATED	**DATE:**	7/8/94
PROJ. LOCATION	CHEEKTOWAGA, NEW YORK	**CREW:**	M A LINDBERG
VEG. COVER	WOODED	**PHOTO NO.**	1028
OBS POINT	TRANSECT 2 NO. 5	**FACING:**	SW

VEGETATION

SPECIES	STRATA	% COVER
POPULUS DELTOIDES	T	30
SALIX NIGRA	T	20
FRAXINUS PENNSYLVANICA	T	10
CORNUS FOEMINA	S	20
LONICERA TATARICA	S	20
VITIS VULPINA	S	10
LYSIMACHIA NUMMULARIA	H	30
GEUM LACINIATUM	H	20
ASTER SPP.	H	10
ALIUM VINEALE	H	5
ASTER SPP.	H	5

HYDROLOGY

STAINED LEAVES		**BUTTRESSING**	
SED. DEPOSITS		**ADV. ROOTS**	

WATER MARKS:
TOPOGRAPHY
OTHER

DEBRIS DRIFT
INUNDATED NO

WILDLIFE

OBSERVED: *TURDUS MIGRATORIUS*
TRACKS/SCAT

COMMENTS: AREA HAS BEEN PARTIALLY FILLED

DETAILED FIELD DATA SHEET

PROJECT: LEICA INCORPORATED
PROJ. LOCATION CHEEKTOWAGA, NEW YORK
VEG. COVER SHRUB
OBS POINT TRANSECT 2 NO. 6

DATE: 7/8/94
CREW: M A LINDBERG
PHOTO NO. 1017
FACING: EAST

VEGETATION

SPECIES	STRATA	% COVER
POPULUS DELTOIDES	S	40
CORNUS FOEMINA	S	20
FRAXINUS PENNSYLVANICA	S	5
DIPSACUS SYLVESTRIS	H	10
SOLIDAGO ALTISSIMA	H	15
EUTHANIA GRAMINIFOLIA	H	5
FRAGARIA VIRGINIANA	H	10
GEUM LACINIATUM	H	5
POTENTILLA RECTA	H	5
AGROSTIS ALBA	H	10
PHLEUM PRATENSE	H	5
VICIA CRACCA	H	5
CAREX SPP.	H	10
DAUCUS CAROTA	H	5

HYDROLOGY

STAINED LEAVES
SED. DEPOSITS
WATER MARKS:
TOPOGRAPHY
OTHER

BUTTRESSING
ADV. ROOTS
DEBRIS DRIFT
INUNDATED NO

WILDLIFE

OBSERVED:
TRACKS/SCAT *PROCYON LOTOR*

COMMENTS: BUSH-HOGGED

DETAILED FIELD DATA SHEET

PROJECT: LEICA INCORPORATED
PROJ. LOCATION CHEEKTOWAGA, NEW YORK
VEG. COVER WOODED/CLEARED
OBS POINT TRANSECT 3 NO. 7

DATE: 7/8/94
CREW: M A LINDBERG
PHOTO NO. 1051
FACING: NORTHWEST

VEGETATION

SPECIES	STRATA	% COVER
POPULUS DELTOIDES	T	15
FRAXINUS PENNSYLVANICA	T/S	10
CORNUS FOEMINA	S	10
LYSIMACHIA NUMMULARIA	H	30
AMBROSIA ARTEMISIIFOLIA	H	10
HEMEROCALLIS FULVA	H	5
HELIANTHUS TUBEROSUS	H	5
ASCLEPIUS SYRIACA	H	5
DAUCUS CAROTA	H	5
ALLIUM VINEALE	H	5

HYDROLOGY

STAINED LEAVES	X	**BUTTRESSING**	
SED. DEPOSITS		**ADV. ROOTS**	
WATER MARKS:	X	**DEBRIS DRIFT**	X
TOPOGRAPHY	XX	**INUNDATED**	NO
OTHER	DEPRESSIONS/POOLS		

WILDLIFE

OBSERVED:

TRACKS/SCAT *PROCYON LOTOR*

COMMENTS:

DETAILED FIELD DATA SHEET

PROJECT:	LEICA INCORPORATED	**DATE:**	7/8/94
PROJ. LOCATION	CHEEKTOWAGA, NEW YORK	**CREW:**	M A LINDBERG
VEG. COVER	WOODED	**PHOTO NO.**	1100
OBS POINT	TRANSECT 3 NO. 8	**FACING:**	WEST

VEGETATION

SPECIES	STRATA	% COVER
POPULUS DELTOIDES	T	15
SALIX NIGRA	T	15
POPULUS TRMULA	T	10
CORNUS FOEMINA	S	5
LYSIMACHIA NUMMULARIA	H	30
ALLIUM VINEALE	H	10

HYDROLOGY

STAINED LEAVES	X	**BUTTRESSING**	
SED. DEPOSITS	X	**ADV. ROOTS**	
WATER MARKS:	X	**DEBRIS DRIFT**	X
TOPOGRAPHY	X	**INUNDATED**	
OTHER	WATER IMPOUNDED BY FILL		

WILDLIFE

OBSERVED: *QUISCALUS QUISCULA*

TRACKS/SCAT

COMMENTS: AREA HAS BEEN BUSH HOGGED

DETAILED FIELD DATA SHEET

PROJECT:	LEICA INCORPORATED	**DATE:**	7/8/94
PROJ. LOCATION	CHEEKTOWAGA, NEW YORK	**CREW:**	M A LINDBERG
VEG, COVER	SHRUB/HERBACEOUS	**PHOTO NO.**	1104
OBS POINT	TRANSECT 3 NO. 9	**FACING:**	NORTHWEST

VEGETATION

SPECIES	STRATA	% COVER
POPULUS DELTOIDES	S	15
FRAXINUS PENNSYLVANICA	S	10
JUNCUS EFFUSUS	H	20
TYPHA LATIFOLIA	H	10
LYSIMACHIA NUMMULARIA	H	5
EUTHANIA GRAMINIFOLIA	H	10
SCIRPUS CYPERINUS	H	5
CAREX TRIBULOIDES	H	5
CAREX STRICTA	H	5

AGROSTIS ALBA	H	5
GEUM LACINIATUM	H	5
ALLIUM VINEALE	H	5

HYDROLOGY

STAINED LEAVES	X	**BUTTRESSING**	
SED. DEPOSITS		**ADV. ROOTS**	
WATER MARKS:	X	**DEBRIS DRIFT**	
TOPOGRAPHY	X	**INUNDATED**	X
OTHER	WATER IMPOUNDED BY FILL		

WILDLIFE

OBSERVED:

TRACKS/SCAT

COMMENTS:

DETAILED FIELD DATA SHEET

PROJECT:	LEICA INCORPORATED	**DATE:**	7/8/94
PROJ. LOCATION	CHEEKTOWAGA, NEW YORK	**CREW:**	M A LINDBERG
VEG. COVER	WOODED/SHRUB	**PHOTO NO.**	1055
OBS POINT	TRANSECT 4 NO. 10	**FACING:**	EAST

VEGETATION

SPECIES	STRATA	% COVER
SALIX NIGRA	T	30
FRAXINUS PENNSYLVANICA	T	20
CORNUS FOEMINA	S	15
VITIS RIPARIA	S	5
LYSIMACHIA NUMMULARIA	H	15
GEUM LACINIATUM	H	5

FRAGARIA VIRGINIANA	H	5
ALLIUM VINEALE	H	5

HYDROLOGY

STAINED LEAVES
SED. DEPOSITS
WATER MARKS:
TOPOGRAPHY
OTHER

BUTTRESSING
ADV. ROOTS
DEBRIS DRIFT
INUNDATED NO

WILDLIFE

OBSERVED:
TRACKS/SCAT

COMMENTS: BUSH HOGGED

DETAILED FIELD DATA SHEET

PROJECT: LEICA INCORPORATED
PROJ. LOCATION CHEEKTOWAGA, NEW YORK
VEG. COVER WOODED
OBS POINT TRANSECT 4 NO. 11

DATE: 7/8/94
CREW: M A LINDBERG
PHOTO NO. 1111
FACING: NORTHWEST

VEGETATION

SPECIES	STRATA	% COVER
SALIX NIGRA	T	40
FRAXINUS PENNSYLVANICA	T	15
ACER RUBRUM	T	10

POPULUS TREMULA	T	5
LONICERA TATARICA	S	10
LYSIMACHIA NUMMULARIA	H	20
ALLIUM VINEALE	H	5
SOLIDAGO ALTISSIMA	H	5
HEMEROCALLIS FULVA	H	5
DAUCUS CAROTA	H	5

HYDROLOGY

STAINED LEAVES X
SED. DEPOSITS X
WATER MARKS: X
TOPOGRAPHY X
OTHER WATER IMPOUNDED BY FILL

BUTTRESSING
ADV. ROOTS
DEBRIS DRIFT
INUNDATED

WILDLIFE

OBSERVED:
TRACKS/SCAT

COMMENTS: BUSH HOGGED, FILL PILES

DETAILED FIELD DATA SHEET

PROJECT: LEICA INCORPORATED
PROJ. LOCATION CHEEKTOWAGA, NEW YORK
VEG. COVER OPEN FIELD
OBS POINT TRANSECT 4 NO. 12

DATE: 7/8/94
CREW: M A LINDBERG
PHOTO NO. 1108
FACING: EAST

VEGETATION

SPECIES	STRATA	% COVER

POPULUS DELTOIDES	T/S	10
POPULUS TREMULA	T/S	5
SOLIDAGO ALTISSIMA	H	15
EUTHANIA GRAMINIFOLIA	H	5
DIPSACUS SYLVESTRIS	H	5
EQUISETUM ARVENSE	H	10
TARAXACUM OFFICINALE	H	5
APOCYNUM ANDROSAEMIFOLIUM	H	5
FRAGARIA VIRGINIANA	H	5
ARCTIUM MINUS	H	5
TRIFOLIUM PRATENSE	H	5
PHLEUM PRATENSE	H	5
POTENTILLA RECTA	H	5
SONCHUS ARVENSIS	H	5
ASCLEPIAS SYRIACA	H	5

HYDROLOGY

STAINED LEAVES		**BUTTRESSING**	
SED. DEPOSITS		**ADV. ROOTS**	
WATER MARKS:		**DEBRIS DRIFT**	
TOPOGRAPHY		**INUNDATED**	NO
OTHER			

WILDLIFE

OBSERVED:

TRACKS/SCAT

COMMENTS: AREA HAS BEEN FILLED AND GRADED

DETAILED FIELD DATA SHEET

PROJECT:	LEICA INCORPORATED	**DATE:**	7/8/94
PROJ. LOCATION	CHEEKTOWAGA, NEW YORK	**CREW:**	M A LINDBERG
COMMUNITY:		**PHOTO NO.**	
OBS POINT		**FACING:**	

VEGETATION

SPECIES	STRATA	% COVER

HYDROLOGY

STAINED LEAVES

SED. DEPOSITS

WATER MARKS:

TOPOGRAPHY

OTHER

BUTTRESSING

ADV. ROOTS

DEBRIS DRIFT

INUNDATED

WILDLIFE

OBSERVED:

TRACKS/SCAT

COMMENTS:

OBSERVATION POINT NUMBER 12

LEICA INC.
CHEEKTOWAGA, NY

OBSERVATION POINT NUMBER 1

LEICA INC.
CHEEKTOWAGA, NY

OBSERVATION POINT NUMBER 2

LEICA INC.
CHEEKTOWAGA, NY

OBSERVATION POINT NUMBER 3

LEICA INC.
CHEEKTOWAGA, NY

OBSERVATION POINT NUMBER 4

LEICA INC.
CHEEKTOWAGA, NY

OBSERVATION POINT NUMBER 5

LEICA INC.
CHEEKTOWAGA, NY

OBSERVATION POINT NUMBER 6

LEICA INC.
CHEEKTOWAGA, NY

OBSERVATION POINT NUMBER 7

LEICA INC.
CHEEKTOWAGA, NY

OBSERVATION POINT NUMBER 8

LEICA INC.
CHEEKTOWAGA, NY

11 - 04

OBSERVATION POINT NUMBER 9

LEICA INC.
CHEEKTOWAGA, NY

OBSERVATION POINT NUMBER 10

LEICA INC.
CHEEKTOWAGA, NY

OBSERVATION POINT NUMBER 11

LEICA INC.
CHEEKTOWAGA, NY

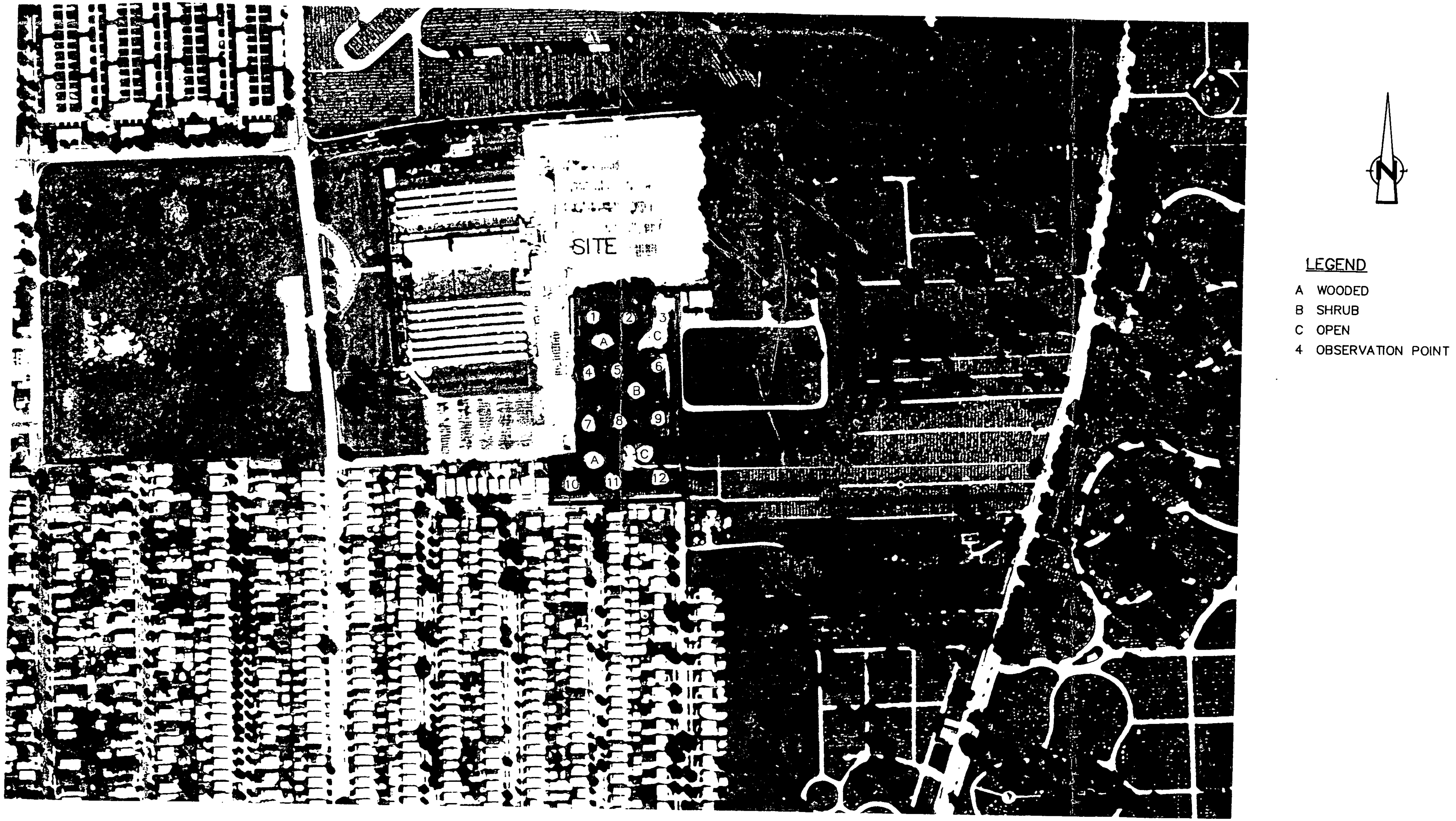
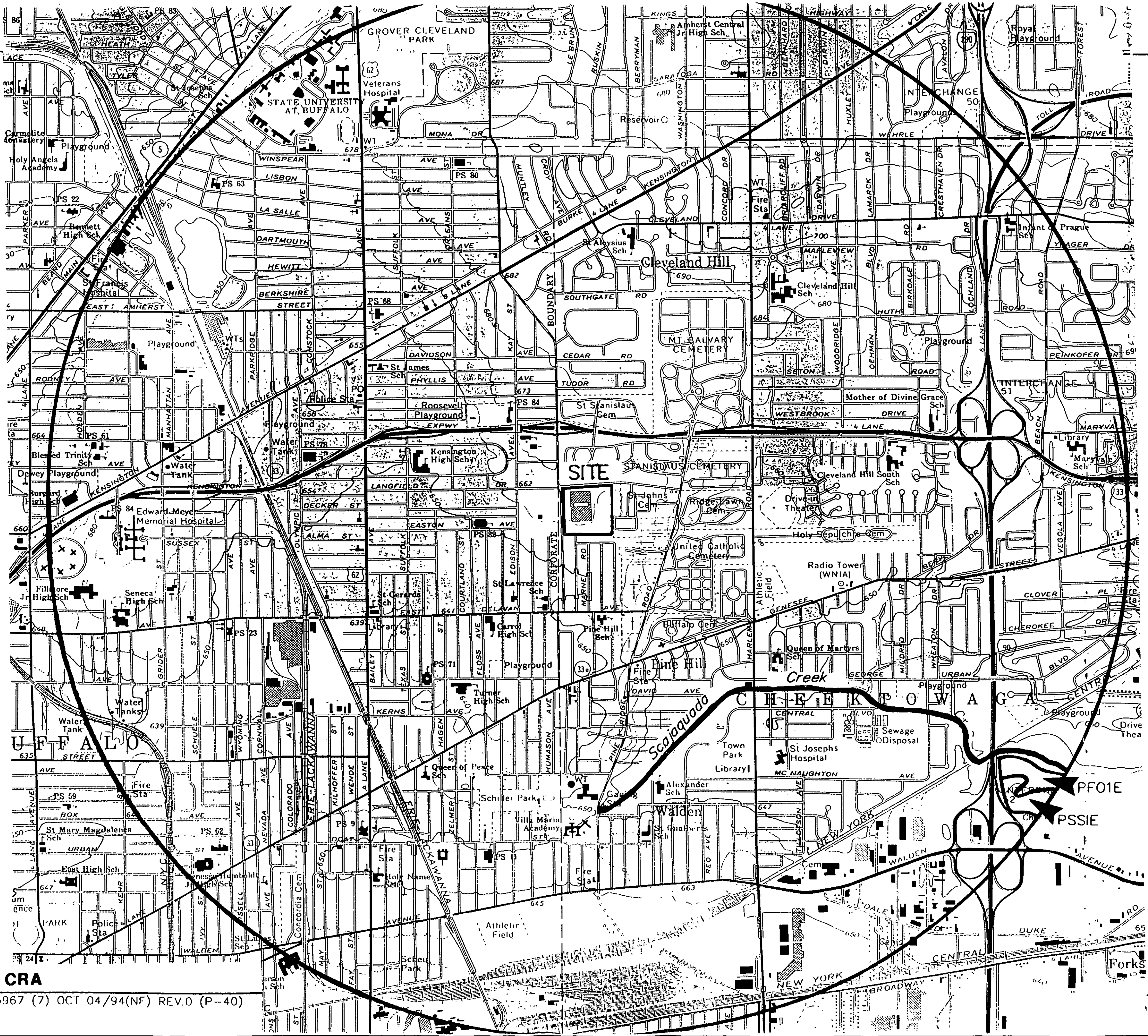


figure 2.2

VEGETATION COVERTYPE MAP
LEICA, INC.
Cheektowaga, New York

CRA



BUFFALO NE QUAD AND NATIONAL WETLANDS INVENTORY MAP.

figure 2.1

NATURAL RESOURCES MAP
LEICA, INC.
Cheektowaga, New York

CRA

3967 (7) OCT 04/94(NF) REV.0 (P-40)

APPENDIX J

AIR PATHWAY ANALYSIS REPORT

TABLE OF CONTENTS

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LIST OF FIGURES
(Following Report)

LIST OF TABLES
(Following Report)

LIST OF ATTACHMENTS
(Following Report)

1.0 INTRODUCTION

1.1 GENERAL

Preliminary air pathway analyses have been performed as part of the Remedial Investigation/Feasibility Study (RI/FS) being conducted at the Leica Inc., Cheektowaga, New York facility (Site). The RI/FS is being performed in accordance with the terms and conditions of an Administrative Order on Consent (AOC), Index No. B9-0396-92-01, entered into by Leica Inc. and the New York State Department of Environmental Conservation (NYSDEC) and the RI/FS Work Plan dated June 1993. Figure J.1 presents a Site location map. Figure J.2 shows the layout of the Site.

This report presents the results of the preliminary air pathway analyses which involved the mathematical evaluation of potential air discharges of selected compounds as agreed upon by the NYSDEC in a telephone conversation between Greg Sutton (NYSDEC) and Mark Kleiman (Conestoga-Rovers & Associates [CRA]) in July 1994. The compounds included in the air pathway analyses consisted of the following:

i) total 1,2-dichloroethene (Total 1,2-DCE);
ii) ethylbenzene;
iii) toluene;
iv) trichloroethene (TCE);
v) 1,1,1-trichloroethane;
vi) vinyl chloride; and
vii) xylenes.

The analyses were performed to predict the annual average ambient air concentration/emission rate. The results are summarized in Table J.1.

Figure J.3 presents a Site map which displays the ground surface cover at the Site. Only sample locations in grassy or vegetated areas of the Site were included in these analyses. Sample locations which are covered with asphalt/concrete were not included in the air pathway analyses as these types of surface covers eliminate or greatly reduce the potential releases of volatile contaminants to the air pathway. The preliminary air pathway analyses were conducted to determine the need for further air pathway analyses at the Site.

1.2 BACKGROUND

The Site occupies 24 acres of land and is located on the flat Lake Erie Plain in the Town of Cheektowaga, New York, as shown on Figure J.1. In 1990, as a prelude to the possible sale of the property, an environmental audit and Site assessment were conducted. The Site assessment included the installation of four overburden wells and nine boreholes, and the collection and analysis of soil and overburden groundwater samples. The results of the Site assessment showed volatile organic compound (VOC) presence in the soils and overburden groundwater at the Site, primarily ethylbenzene, 1,2-DCE, xylene, acetone, and vinyl chloride. Reported total VOC concentration ranged from 35 micrograms/kilogram (µg/kg) to 9,390 µg/kg.

CRA was retained in 1991 to verify the results of the Site assessment and to conduct a Site Investigation (SI) to determine the nature and extent of contaminants on the Site. Additional overburden monitoring wells were installed and additional soil and overburden groundwater samples were collected for analysis in 1991 and 1992. Results of the SI confirmed the Assessment results and showed TCE to be a major Site contaminant in addition to the ones listed above. It was also determined that contaminants were present at the eastern property line and may be present under an adjacent six acre wooded parcel located east of the Site. An AOC was negotiated with the NYSDEC in October 1993 whereby an RI/FS of the Site and the adjacent off-Site parcel would be conducted to characterize the complete nature and extent of residual contamination at the Site and the associated risks posed by such residential contamination at the Site which is or may be present as a result of historic operations.

2.0 PRELIMIANRY AIR PATHWAY ANALYSES

2.1 GENERAL

The Preliminary Air Pathway Analysis involved the mathematical evaluation of potential air discharge of total 1,2-DCE, ethylbenzene, toluene, TCE, 1,1,1-TCA, vinyl chloride, and xylene from the potential source area defined by ground surface cover and bulk soil concentrations. Predictive emissions modeling techniques were used to calculate theoretical emission rates of the volatile organic compounds from the soil due to diffusion. Diffusion emission rate models predict emission rates as a function of contaminant concentrations and contaminant physical and chemical properties within surrounding media (i.e., within soils, surface water, etc.) and through measured or theoretically derived mass transfer coefficients. A summary of the sample locations and maximum observed contaminant concentrations are presented in Table J.2.

The air pathway analyses were conducted as specified in the RI/FS Work Plan and as directed by the NYSDEC. The analyses were performed using both United States Environmental Protection Agency (USEPA) and NYSDEC guidance documents. All calculations, formulas, and assumptions are presented as Attachment J.1 of this Preliminary Air Pathways Analysis report. Physical constants are presented in Table J.3.

The maximum observed concentration of each VOC was used for each sample location. The guidance document (USEPA Air/Superfund National Technical Guidance Study Series, "Guideline for Predictive Baseline Emissions Estimation Procedures for Superfund Sites", Interim-Final, USEPA Report No. EPA/1-92-002, dated January 1992, herein referred to as USEPA Guideline) specifies that values equal to one-half of the quantitation limit are to be included in the analyses for sample locations which contained no detectable compounds. This was done for each location. The mean bulk concentration of each VOC used in the emissions and dispersion modeling are summarized in Table J.2.

2.2 POTENTIAL SOURCE AREA

Preliminary air pathway analyses were performed for the area of the Site shown on Figure J.4. This area is approximately 225 feet by 75 feet and is covered with a variety of vegetation including mature hardwood trees, shrubs, and open meadow vegetation.

2.3 ANALYSES USING USEPA GUIDELINE

Estimates of the saturation concentration (C_{sat}) for each contaminant were calculated as outlined in the USEPA Guideline, using the equation:

$$C_{sat} = (K_d \times S \times n_m) + (S \times \theta_m)$$

Where:

C_{sat} = Saturation Concentration, mg/kg (ppm)
K_d = Soil/water partition coefficient, l/kg (or ml/g)
S = Solubility of contaminant in water, mg/l-water
n_m = Soil moisture content expressed as a weight fraction Kg = water/Ky = soil
θ_m = Soil moisture content, l-water/kg - soil (or ml/g).

K_d was determined as outlined in the USEPA Guideline using the equation:

$$K_d = K_{oc} \times f_{oc}$$

Where:

K_d = Soil/water partition coefficient, l/kg (or ml/g)
K_{oc} = Organic carbon partition coefficient, l/kg (or ml/g)
f_{oc} = Fraction of organic carbon in soil, mg/mg (default = 0.02)

All contaminants were present at concentrations below saturated levels.

The emission rate to ambient air for each contaminant in grams per second (g/s) from subsurface soils using bulk concentrations (at levels below saturation) was calculated as outlined in the USEPA Guideline using the equation:

$$E_i = \frac{A2\ D_{ei}\ \Sigma\ K_{as}\ C_i}{(\pi\ \gamma t)^{1/2}}$$

Where:

E_i = Average emission rate of component i for exposure interval t, g/s

D_{ei} = Effective diffusivity of component i, cm^2/s^2 $(D_i \Sigma^{0.33})$

D_i = Molecular diffusivity of component in air, cm^2/s

K_{as} = Soil/air partition coefficient, g/cm^3

$$K_{as} = (H/k_d) \times 41$$

Where:

K_{as} = Soil/air partition coefficient, g/cm^3

H = Henry's Law constant of component i, atm-m^3/mode

k_d = Soil/water partition coefficient m/g or cm^3/g

41 = Conversion factor change H to dimensionless form

C_i = Bulk soil concentration of component i, g/g

t = Exposure interval, s (exposure time x exposure frequency x exposure duration in seconds)

Σ = Soil porosity, dimensionless Σ = pt for dry soil

$$\Sigma = 1 - \frac{\beta}{\rho}$$

Where:

β = Soil bulk density, g/cm^3 (default = 1.5 g/cm^3)

ρ = Particle density, g/cm^3 (default = 2.65 g/cm^3)

A = Exposed surface area, cm2

$$\gamma = \frac{\text{Dei}\ \Sigma}{\Sigma + (\rho)(1-\Sigma)/\text{Kas}}$$

The estimated emission rates of VOCs from the source area are summarized in Table J.1. Detailed calculations are provided in Attachment J.1.

2.4 ANALYSES USING NYSDEC AIR GUIDE 1

The emission rate for each contaminant was calculated as described in Section 2.3.

The resultant emission rate was then used as input in air dispersion models to determine the estimated actual annual impact, maximum potential annual impact, and maximum short-term impact for each contaminant from an area source at a specified downwind distance as outlined the NYSDEC Air Guide 1. These concentrations were compared to the NYSDEC Annual Guidelines Concentration (AGC) and Short-Term Guideline Concentration (SGC) standards for each compound.

The maximum actual annual impact was obtained from NYSDEC Air Guide 1 using the following equation:

$$C_a\ (\mu g/m^3) = \frac{104\ Q_a}{(D+S)^{1.6} h_A{}^{0.368}}$$

Where:

C_a = Maximum actual annual impact in ($\mu g/m^3$)

Q_a = Is the annual emission rate (Ei from USEPA Guideline calculations converted from g/s to lbs/year)

Q_a(lb/year) = $E_i \frac{\text{grams}}{\text{second}} \times 2.205 \times 10^{-3} \frac{\text{lb}}{\text{gram}} \times 3{,}600 \frac{\text{seconds}}{\text{hour}} \times 24 \frac{\text{hours}}{\text{day}} \times 365 \frac{\text{days}}{\text{year}}$

D = Distance from the center of the area source to the desired point of impact in feet

S = Side length of the area source in feet

h_A = Height of the area source in feet

The maximum potential annual impact was obtained from the NYSDEC Air Guide 1 using the following equation:

$$Cp\ (\mu g/m^3) = \frac{914{,}000\ Q}{(D+S)^{1.6} h_A{}^{0.368}}$$

Where:

Cp = Maximum potential annual impact ($\mu g/m^3$)

Q = The hourly emission rate (Ei from USEPA Guideline calculations converted from g/s to lb/hr)

$$Q\frac{lb}{hr} = E_i \frac{grams}{second} \times 2.205 \times 10^{-3} \frac{lb}{gram} \times 3{,}600 \frac{seconds}{hour}$$

and D, S and h_A are as defined above.

The maximum short-term impact was obtained from NYSDEC Air Guide I:

$$C_{ST}(\mu g/m^3) = Cp\ 100$$

Where:

C_{ST} = Maximum short-term impact ($\mu g/m^3$)

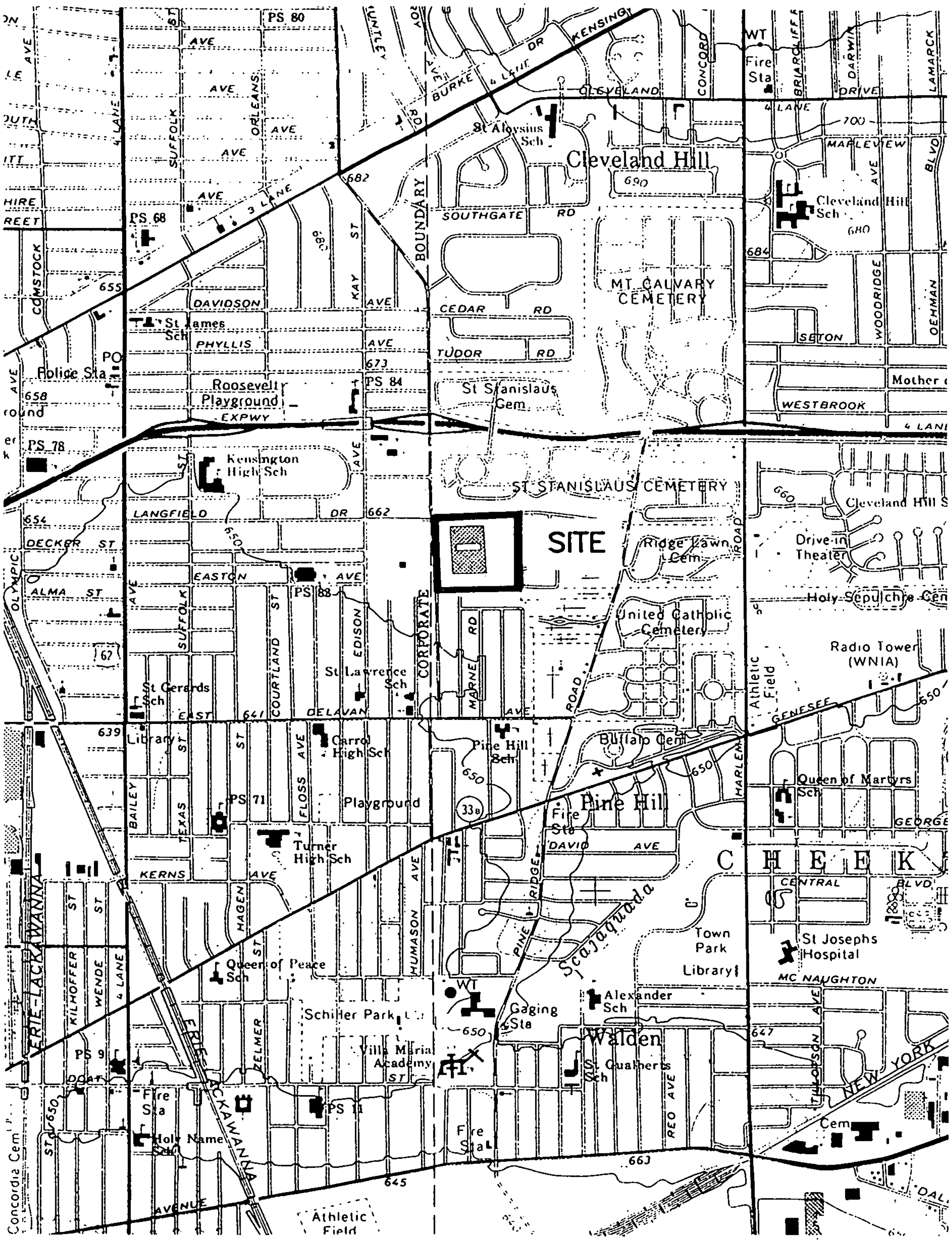
Cp = Maximum potential annual impact as defined above ($\mu g/m^3$)

The estimated maximum actual annual impact, potential annual impact and short term impact concentrations for each VOC are summarized in Table J.1. Detailed dispersion calculations for each compound are provided in Attachment J.1.

3.0 CONCLUSION

The values calculated in the Preliminary Air Pathway Analyses may be compared with the NYSDEC AGC and SGC concentration standards summarized for each compound in Table J.1. Table J.1 demonstrates that the estimated maximum annual and short-term impact concentrations are at least one order of magnitude lower than their respective AGC and SGC standards. Therefore, it is concluded that the air emission of each component at the Site warrants no further air sampling or analysis.

FIGURES



SOURCE:

USGS BUFFALO NE QUADRANGLE

figure J.1

SITE LOCATION MAP
AIR PATHWAY ANALYSIS
LEICA, INC.
Cheektowaga, New York

CRA

TABLE J.2

AREA #1 - BULK SOIL CONCENTRATIONS (µg/kg)
PRELIMINARY AIR PATHWAY ANALYSIS
LEICA INC., CHEEKTOWAGA, NEW YORK

Sample Location	*Sample Depth*	*Total 1,2-DCE*	*Ethylbenzene*	*Toluene*	*TCE*	*Vinyl Chloride*	*Total Xylenes*	*1,1,1-TCA*
BH-1-93	0.0 - 3.0	55	ND(12)	ND(12)	150J	ND(12)	ND(12)	ND(12)
BH-2-93	0.0 - 3.0	6J	ND(14)	ND(14)	5J	ND(14)	ND(14)	ND(14)
BH-3-93	1.5 - 3.0	160D	42	39	ND(13)	42	190D	ND(13)
BH-3C-93	1.5 - 2.5	19	ND(12)	ND(12)	8J	ND(12)	ND(12)	8J
MW-13	2.0 - 4.0	ND(12)J	ND(12)	ND(12)	ND(12)	ND(12)	ND(12)	ND(12)
MW-13	8.0 - 11.0	ND(11)J	ND(11)	ND(11)	ND(11)	ND(11)	ND(11)	ND(11)
BH-10-94	10.5 - 12.5	1J	ND(11)	ND(11)	ND(11)	ND(11)	ND(11)	ND(11)
Total Bulk Concentration (µg/kg)		**253**	**79**	**76**	**188**	**79**	**227**	**44**
Mean Bulk Concentration (µg/kg)		**37**	**12**	**11**	**27**	**12**	**33**	**7**

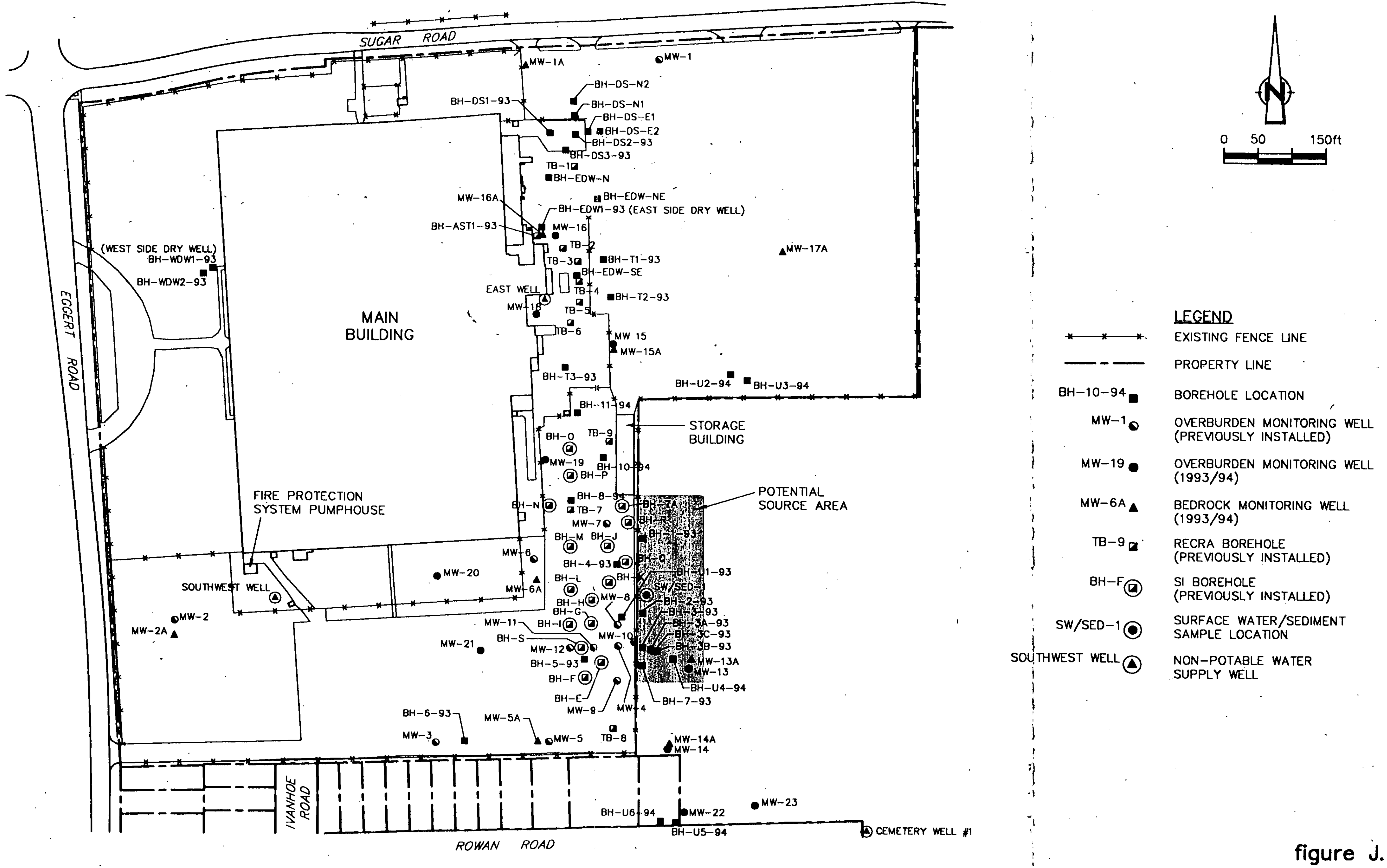
Notes:

D	Analyzed at a dilution.
J	Estimated value - result is less than detection limit.
ND(x)	Not detected at or above associated value.

Total and mean bulk concentrations calculated using one-half of stated detection limit.

Key:

1,1,1-TCA	1,1,1-Trichloroethane.
1,2-DCE	1,2-Dichloroethene.
TCE	Trichloroethene.



SOURCE: GARY E. KRULL, LAND SURVEYOR
11651 WHITETAIL DRIVE
MARILLA, NEW YORK 14102
(716) 655-1654

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figure J.4

POTENTIAL SOURCE AREA
AIR PATHWAY ANALYSIS
LEICA, INC.
Cheektowaga, New York

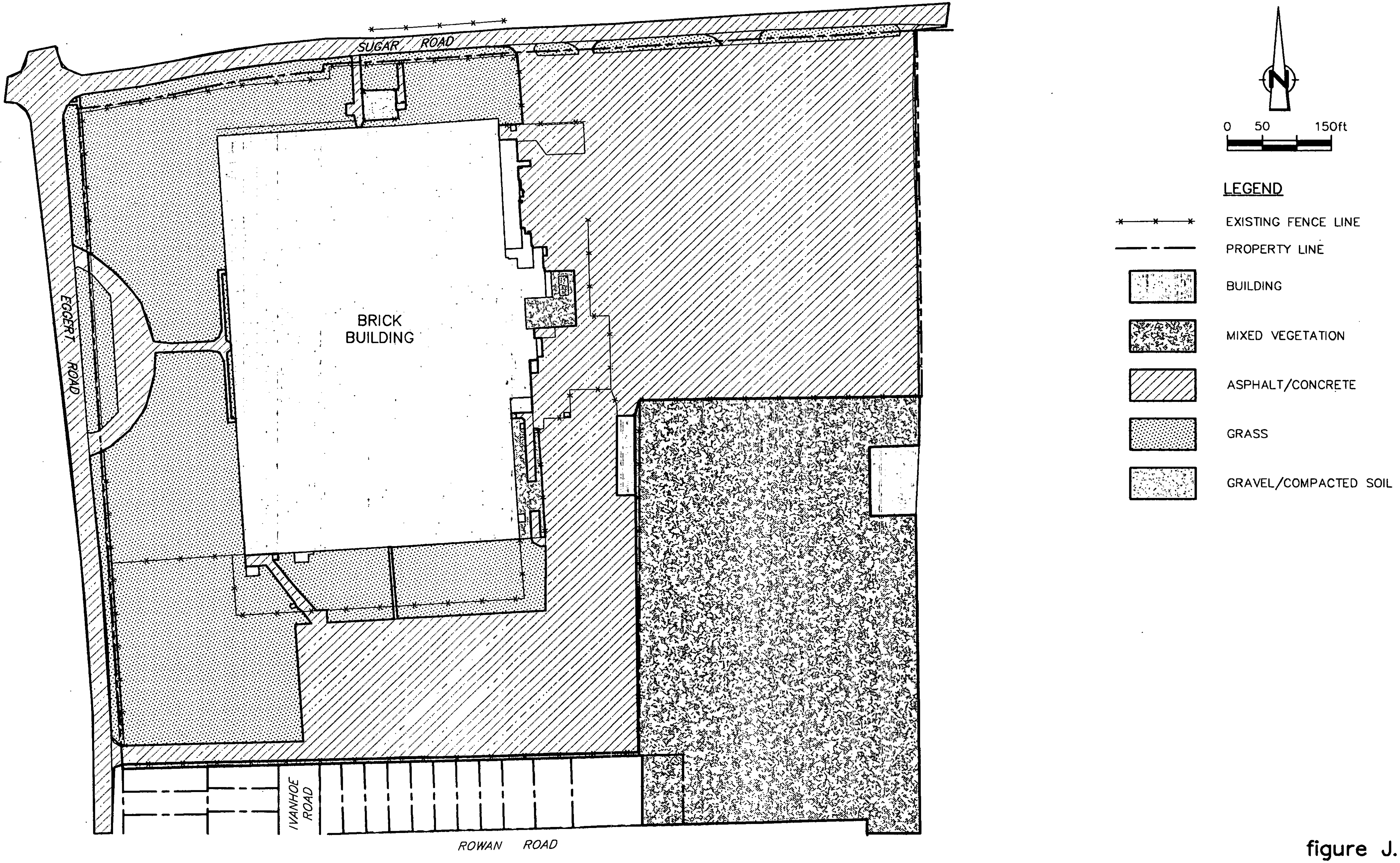

figure J.3

SURFACE CHARACTERISTICS
AIR PATHWAY ANALYSIS
LEICA, INC.
Cheektowaga, New York

SOURCE: GARY E. KRULL, LAND SURVEYOR
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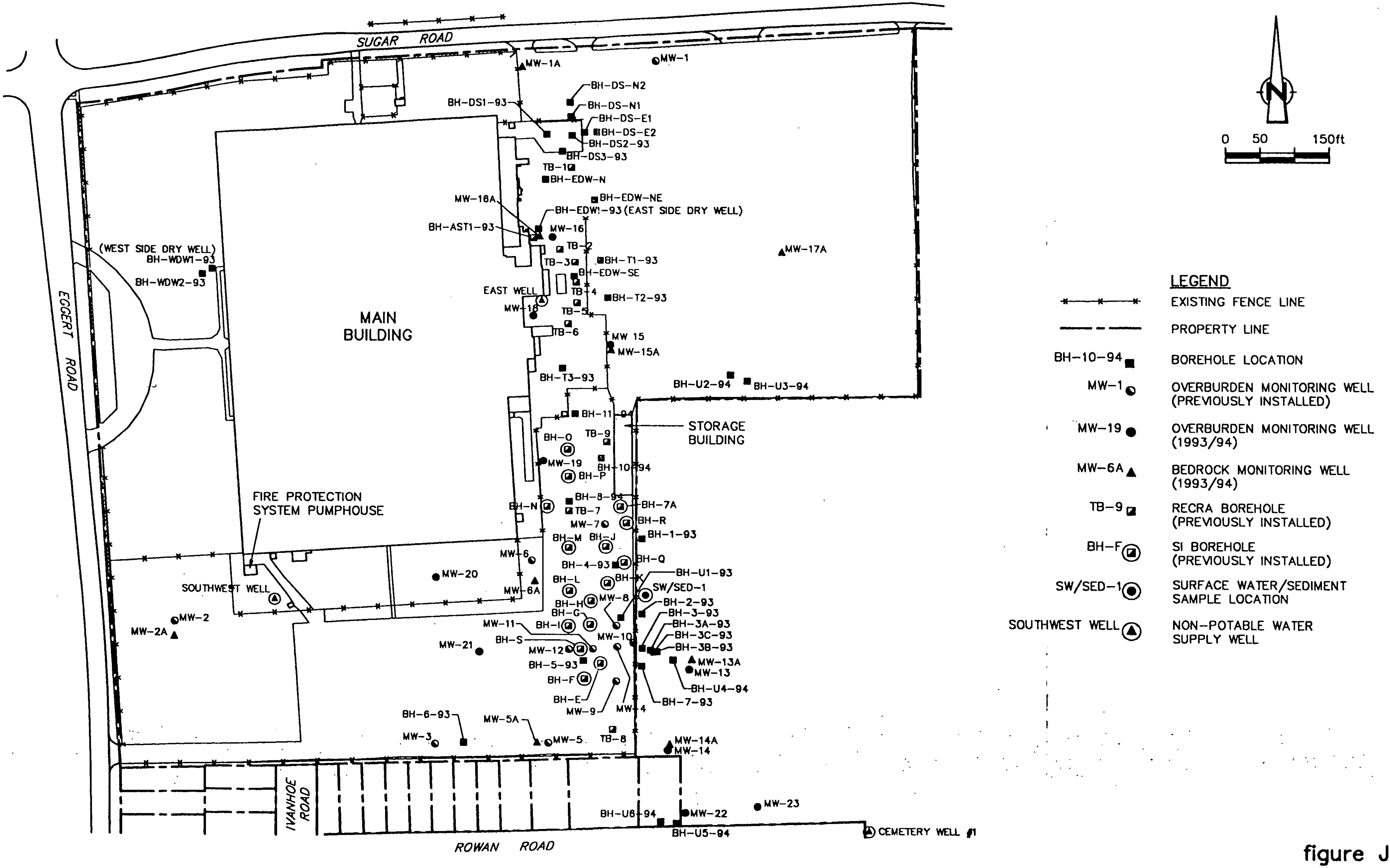
3967 (3) SEP 30/94(NF) REV.0 (P-37)



SOURCE: GARY E. KRULL, LAND SURVEYOR
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MARILLA, NEW YORK 14102
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figure J.2

SITE LAYOUT
AIR PATHWAY ANALYSIS
LEICA, INC.
Cheektowaga, New York

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3967 (7) JAN 17/95(NF) REV.1 (P-36)

TABLES

TABLE J.1

ESTIMATED AMBIENT AIR CONCENTRATIONS
PRELIMINARY AIR PATHWAY ANALYSIS
LEICA INC., CHEEKTOWAGA, NEW YORK

Component	Emission Rate Ei (g/s)(1)	Maximum Actual Impact Ca (μg/m³) (1)	Maximum Potential Impact Cp (μg/m³) (1)	Maximum Short Term Impact Cst (μg/m³) (1)	NYSDEC Guidance Concentrations (2) AGC (μg/m³)	SGC (μg/m³)
Total 1,2-Dichloroethene	2.22E-06	8.88E-04	8.92E-04	8.92E-02	0.039	190,000
Ethylbenzene	1.40E-07	5.62E-05	5.63E-05	5.63E-03	1,000	100,000
Toluene	2.64E-06	1.06E-03	1.07E-03	1.07E-01	2,000	89,000
Trichloroethene	1.15E-06	4.62E-04	4.63E-04	4.63E-02	0.45	33,000
Vinyl chloride	3.32E-06	1.33E-03	1.34E-03	1.34E-01	0.02	1,300
Xylenes	8.46E-07	3.39E-04	3.41E-04	3.41E-02	300	100,000
1,1,1-Trichloroethane	3.41E-07	1.37E-04	1.37E-04	1.37E-02	1,000	450,000

Notes:

(1) Calculated.

(2) Annual and Short-Term Guidance Concentrations from NYSDEC Divison of Air Resources "Air Guide 1".

TABLE J.2

AREA #1 - BULK SOIL CONCENTRATIONS (µg/kg)
PRELIMINARY AIR PATHWAY ANALYSIS
LEICA INC., CHEEKTOWAGA, NEW YORK

Sample Location	*Sample Depth*	*Total 1,2-DCE*	*Ethylbenzene*	*Toluene*	*TCE*	*Vinyl Chloride*	*Total Xylenes*	*1,1,1-TCA*
BH-1-93	0.0 - 3.0	55	ND(12)	ND(12)	150J	ND(12)	ND(12)	ND(12)
BH-2-93	0.0 - 3.0	6J	ND(14)	ND(14)	5J	ND(14)	ND(14)	ND(14)
BH-3-93	1.5 - 3.0	160D	42	39	ND(13)	42	190D	ND(13)
BH-36-93	1.5 - 2.5	19	ND(12)	ND(12)	8J	ND(12)	ND(12)	8J
MW-13	2.0 - 4.0	ND(12)J	ND(12)	ND(12)	ND(12)	ND(12)	ND(12)	ND(12)
MW-13	8.0 - 11.0	ND(11)J	ND(11)	ND(11)	ND(11)	ND(11)	ND(11)	ND(11)
BH-10-94	10.5 - 12.5	1J	ND(11)	ND(11)	ND(11)	ND(11)	ND(11)	ND(11)
Total Bulk Concentration (µg/kg)		**253**	**79**	**76**	**188**	**79**	**227**	**44**
Mean Bulk Concentration (µg/kg)		**37**	**12**	**11**	**27**	**12**	**33**	**7**

Notes:

D	Analyzed at a dilution.
J	Estimated value - result is less than detection limit.
ND(x)	Not detected at or above associated value.

Total and mean bulk concentrations calculated using one-half of stated detection limit.

Key:

1,1,1-TCA	1,1,1-Trichloroethane.
1,2-DCE	1,2-Dichloroethene.
TCE	Trichloroethene.

TABLE J.3

PHYSICAL CONSTANTS USED IN AIR PATHWAY ANALYSIS
PRELIMINARY AIR PATHWAY ANALYSIS
LEICA INC., CHEEKTOWAGA, NEW YORK
CHEEKTOWAGA, NEW YORK

Compounds	*Log Kow (1)*	*Unitless Kow ***	*Koc (1) (mL/g)*	*S (mg/L)*	*Di (25 °C) (3) (cm2/s)*	*Csi (25 °C) (4) (g/cm3)*	*P (1) (mm/hg)*	*R (2)* $\left(\frac{mm\ Hg \cdot cm2}{mol \cdot n}\right)$	*MWi (1) (g/mol)*	*H (6) (atm m3/mole)*
cis(1,2)Dichloroethene	0.70	5.01	49	3,500	0.1* (5)	0.0011	208	62,361	97	7.58 E-03
trans(1,2)Dichloroethene	0.48	3.02	59	6,300	0.1* (5)	0.0017	324	62,361	97	6.56 E-03
Ethylbenzene	3.15	1,413	1,100	152	0.0750	0.0000399	7.00	62,361	106	6.43 E-03
Toluene	2.73	537.0	300	535	0.0870	0.00014	28.1	62,361	92	6.37 E-03
1,1,1-Trichloroethane	2.5	316	152	1,500	0.0780	0.000880	123	62,361	133	1.44E - 02
Trichloroethene	2.38	239.9	126	1,100	0.0790	0.000408	57.9	62,361	131	9.10 E-03
Vinyl chloride	1.38	23.99	57	2,670	0.106 (5)	0.0090	2,660	62,361	63	8.19 E-02
Xylenes (total) Mixed	3.26	1820	240	198	0.0717	0.0000570	10.0	62,361	106	7.04 E-03

Notes:

(1) OSWER Directive 9285.4-1.
(2) Perry's Chemical Engineers Handbook.
(3) Air/Superfund National Technical Guidance Study Series, Pg. A-4.
(4) Air/Superfund National Technical Guidance Study Series, Pg. 14 (formula was used - see Page 15 for sample calculations and description).
(5) Telephone conversation with Gordon Reusing (CRA) for results.
(6) Superfund Pubic Health Evaluation Manual (October 1986).
* Result was estimated using known values for dichloromethane (0.1), dichloroethane (0.1), and trichloroethene (0.0790).
** Calculated from log Kow value given in OSWER Directive 9285.4-1.

ATTACHMENT J.1

CALCULATIONS

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PROJECT No.: 3967
PROJECT NAME: LEICA
DATE: 9-11-94

DESIGNED BY: MK
CHECKED BY:
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STEP III 1.B

$C_{sat} = (K_d \times S \times n_m) + (S \times \Theta_m)$

$n_m = 0.20$ (20% AS MEASURED FROM MW-13 3-5' BGS INTERVAL)
$\Theta_m = 0.20$ (20% AS MEASURED FROM MW-13 3-5' BGS INTERVAL)

1,2 DCE

$K_d = K_{oc} \times f_{oc}$
K_d = SOIL/WATER, PARTITION COEFFICIENT
K_{oc} = ORGANIC CARBON PARTITION COEFFICIENT → FROM PHYSICAL CONSTANTS TABLE
f_{oc} = FRACTION OF ORGANIC CARBON IN SOIL → DEFAULT = 0.02

$K_d = 59\ ml/g \times 0.02 = 1.18\ ml/g$

$C_{sat} = (K_d \times S \times n_m) + (S \times \Theta_m)$

$C_{sat} = (1.18\ ml/g \times 6{,}300\ mg/L \times 0.20\ kg/kg + (6{,}300\ mg/L \times 0.20\ kg/kg = 2{,}746.8\ ppm$
2,746,800 ppb

ETHYLBENZENE

$K_d = K_{oc} \times f_{oc}$

$K_d = 1{,}100\ ml/g \times 0.02\ mg/mg = 22.00\ ml/g$

$C_{sat} : (K_d \times S \times n_m) + (S \times \Theta_m)$

$C_{sat} = (22.0\ ml/g \times 152\ mg/L \times 0.20) + (152 \times 0.20) = 699.2\ ppm$
699,200 ppb

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TRICHLOROETHENE

$K_d = K_{oc} \times f_{oc}$

$K_d = 126\ ml/g \times 0.02\ \cancel{mg/mg} = 2.52\ ml/g$

$C_{sat} = (K_d \times S \times n_m) + (S \times \Theta_m)$

$C_{sat} = (2.52\ ml/g \times 1,100\ mg/L \times 0.02) + (1,100 \times 0.02) = 77.44\ ppm$
77,440 ppb

VINYL CHLORIDE

$K_d = K_{oc} \times f_{oc}$

$K_d = 57\ ml/g \times 0.02\ \cancel{mg/mg} = 1.14\ ml/g$

$C_{sat} = (K_d \times S \times n_m) + (S \times \Theta_m)$

$C_{sat} = (1.14\ ml/g \times 2,670\ mg/L \times 0.02) + (2,670 \times 0.02) = 114.274\ ppm$
114,274 ppb

XYLENES

$K_d = K_{oc} \times f_{oc}$

$K_d = 240\ ml/g \times 0.02\ \cancel{mg/mg} = 4.8\ ml/g$

$C_{sat} = (K_d \times S \times n_m) + (S \times \Theta_m)$

$C_{sat} = (4.8\ ml/g \times 198\ mg/L \times 0.02) + (198 \times 0.02) = 22.968\ ppm$
22,968 ppb

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1,1,1 - TRICHLOROETHANE

$Kd = Koc \times foc$

$Kd = 152\ ml/g \times 0.02\ mg/mg = 3.04\ ml/g$

$Csat = (Kd \times S \times n_m) + (S \times \theta_m)$

$Csat = 3.04\ ml/g \times 1500\ mg/l \times 0.20) + (1500 \times 0.20) = 1212.0\ ppm$

$= 1{,}212{,}000\ ppb$

TOLUENE

← $Kd = Koc \times foc$

$Kd = 300\ ml/g \times 0.02$ ~~mg/mg~~ $= 6.0\ ml/g$

$Csat = (Kd \times S \times n_m) + (S \times \theta_m)$

$Csat = (6.0\ ml/g \times 535\ mg/L \times 0.20) + (535 \times 0.20) = 749\ ppm$

$749{,}000\ ppb$

PROJECT No.: 3967
PROJECT NAME: LEICA
DATE: 8-26-94

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EMISSION RATE FOR EACH COMPONENT

EMISSION RATE FOR 1,2 DCE

TOTAL 1,2 DCE → MEAN BULK CONCENTRATION = 37 ug/Kg = $\boxed{C_i = 3.7E\text{-}08 \ g/g}$

$$E_i = \frac{A\,2\,D_{ei}\,\varepsilon\,K_{as}\,C_i}{\sqrt{\pi \alpha t}}$$

$D_{ei} = \varepsilon^{0.33}$ ⇒ SOIL POROSITY CALCULATION ASSUMES DRY SOIL "WORST CASE" SCENARIO

$\varepsilon = 0.36$ BASED ON GEOTECHNICAL DATA FROM MW-13, 3-5' BGS (INTERVAL POROSITY)

$D_i = 0.10$ cm³/s (FROM PHYSICAL CONSTANTS TABLE)

$$\boxed{D_{ei} = 1.0E\text{-}01 \times 0.36^{0.33} = 7.14E\text{-}02 \ cm^2/s}$$

K_{as} = SOIL/AIR PARTITION COEFFICIENT, g/cm³

$K_{as} = (H/K_d) \times 41$

$H = 6.56E\text{-}03$ atm m³/mole (FROM SUPERFUND PUBLIC HEALTH EVALUATION MANUAL OCTOBER, 1986)

$K_d = 1.18$ ml/g (FROM STEP III CALCULATION)

$$\boxed{K_{as} = (6.56E\text{-}03/1.18) \times 41 = 2.28E\text{-}01}$$

$$\boxed{A = 225' \times 75' = 16{,}875 \ FT^2 \times 929 = 15{,}676{,}875 \ cm^2}$$

$\boxed{t = 60 \frac{SEC}{MIN} \times 60 \frac{MIN}{HR} \times 24 \frac{HR}{DAY} \times 350 \frac{DAYS}{YEAR} \times 30 \ YEARS = 9.07\ E{+}08\ S}$ ⇒ THIS REPRESENTS THE UPPER BOUND RESIDENTIAL EXPOSURE. (FROM EPA PB92-171909)

$$\alpha = \frac{D_{ei}\,\varepsilon}{\varepsilon + (\rho)(1-\varepsilon)/K_{as}} \Rightarrow \boxed{\alpha = \frac{7.19E\text{-}02 \times 0.36}{0.36 + (2.65)(1-0.36)/2.28E\text{-}01} = 3.30E\text{-}03}$$

$$\boxed{E_i = \frac{15{,}676{,}875 \times 2 \times 7.14E\text{-}02 \times 3.60E\text{-}01 \times 2.28E\text{-}01 \times 3.7E\text{-}08}{\sqrt{\pi \times 3.30E\text{-}03 \times 9.07E{+}08}} = 2.22E\text{-}06 \ g/s}$$

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PROJECT No.: 3967
PROJECT NAME: LEICA
DATE: 9-11-94

DESIGNED BY: MK
CHECKED BY:
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EMISSION RATE FOR ETHYLBENZENE

ETHYLBENZENE → MEAN BULK CONCENTRATION = 12 ug/kg $\boxed{C_i = 1.2E\text{-}08 \text{ g/g}}$

$$E_i = \frac{A\,2\,D_{ei}\,\varepsilon\,K_{as}\,C_i}{\sqrt{\pi\,\alpha\,t}}$$

$D_{ei} = D_i\,\varepsilon^{0.33} \Rightarrow D_i = 0.075 \text{ cm}^2/\text{s} \Rightarrow \boxed{D_{ei} = 7.5E\text{-}02 \times 0.36^{0.33} = 5.35E\text{-}02 \text{ cm}^2/\text{s}}$

$\varepsilon = 0.36$

$K_{as} = (H/K_d) \times 41 \Rightarrow H = 6.43E\text{-}03 \text{ ATM M}^3/\text{MOLE}$ $\boxed{K_{as} = (6.43E\text{-}03/22.0) \times 41 = 1.20E\text{-}02 \text{ g/cm}^3}$

$K_d = 22.0 \text{ ml/g}$

$\boxed{A = 15{,}676{,}875 \text{ cm}^2}$

$\boxed{t = 9.07E{+}08}$

$$\alpha = \frac{D_{ei}\,\varepsilon}{\varepsilon + (\rho)(1-\varepsilon)/K_{as}} \Rightarrow \boxed{\alpha = \frac{5.35E\text{-}02 \times 0.36}{0.36 + (2.65)(1-0.36)/1.20E\text{-}02} = 1.36E\text{-}04}$$

$$\boxed{E_i = \frac{15{,}676{,}875 \times 2 \times 5.35E\text{-}02 \times 0.36 \times 1.20E\text{-}02 \times 1.20E\text{-}08}{\sqrt{\pi \times 1.36E\text{-}04 \times 9.07E{+}08}} = 1.40E\text{-}07 \text{ g/s}}$$

EMISSION RATE FOR TOLUENE

TOLUENE → MEAN BULK CONCENTRATION = 11.0 ug/Kg

$\boxed{C_i = 11.0\ E-08\ g/g}$

$$E_i = \frac{A\,2\,D_{ei}\,\varepsilon\,K_{as}\,C_i}{\sqrt{\pi \alpha t}}$$

$D_{ei} = D_i \varepsilon^{0.33} \Rightarrow D_i = 8.7E-02\ cm^2/s \Rightarrow \boxed{D_{ei} = 8.7E-02 \times 0.36^{0.33} = 6.21\ E-02}$

$\varepsilon = 0.36$

$K_{as} = (H/K_d) \times 41 \Rightarrow H = 6.37\ E-03\ ATM\ m^3/MOLE \Rightarrow \boxed{K_{as} = (6.37E-03/6.0) \times 41 = 4.35E-02}$

$K_d = 6.0\ ml/g$

$\boxed{A = 15{,}676{,}875\ cm^2}$

$\boxed{t = 9.07\ E+08\ S}$

$$\alpha = \frac{D_{ei}\,\varepsilon}{\varepsilon + (\rho)(1-\varepsilon)/K_{as}} \Rightarrow \boxed{\alpha = \frac{6.21E-02 \times 0.36}{0.36 + (2.65)(1-0.36)/4.35E-02} = 5.68E-04}$$

$$\boxed{E_i = \frac{15{,}676{,}875 \times 2 \times 6.21\,E-02 \times 0.36 \times 4.35E-02 \times 11.0\,E-08}{\sqrt{\pi \times 5.68E-04 \times 9.07E+08}} = 2.64E-06\ g/s}$$

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EMISSION RATE FOR TCE

TCE → MEAN BULK CONCENTRATION = 27 ug/kg = $\boxed{C_i = 2.7\text{E-}08\ g/g}$

$$E_i = \frac{A\ 2\ D_{ei}\ \varepsilon\ K_{as}\ C_i}{\sqrt{\pi \alpha t}}$$

$D_{ei} = D_i\,\varepsilon^{0.33}$ $\quad D_i = 7.9\text{E-}02$ $\Rightarrow$ $\boxed{D_{ei} = 7.9\text{E-}02 \times 0.36^{0.33} = 5.64\text{E-}02}$

$\varepsilon = 0.36$

$K_{as} = (H/K_d) \times 41$ $\Rightarrow$ $H = 9.10\text{E-}03$ $\quad \boxed{K_{as} = (9.10\text{E-}03/2.52) \times 41 = 1.48\text{E-}01}$

$K_d = 2.52\ ml/g$

$\boxed{A = 15{,}676{,}875\ cm^2}$

$\boxed{t = 9.07\ \text{E+}08\ s}$

$$\alpha = \frac{D_{ei}\,\varepsilon}{\varepsilon + (\rho)(1-\varepsilon)/K_{as}} \Rightarrow \boxed{\alpha = \frac{5.64\ \text{E-}02 \times 0.36}{0.36 + (2.65)(1-0.36)/1.48\ \text{E-}01} = 1.72\text{E-}03}$$

$$\boxed{E_i = \frac{15{,}676{,}875 \times 2 \times 5.64\text{E-}02 \times 0.36 \times 1.48\text{E-}01 \times 2.7\text{E-}08}{\sqrt{\pi \times 1.72\text{E-}03 \times 9.07\ \text{E+}08}} = 1.15\text{E-}06\ \ g/s}$$

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EMISSION RATE FOR VINYL CHLORIDE

VINYL CHLORIDE → MEAN BULK CONCENTRATION = 12.0 ug/kg

$\boxed{C_i = 1.2E-08 \ g/g}$

$$E_i = \frac{A\,2\,D_{ei}\,\varepsilon\,K_{as}\,C_i}{\sqrt{\pi \alpha t}}$$

$D_{ei} = D_i\,\varepsilon^{0.33}$ $\quad D_i = 0.106$ ⇒ $\boxed{D_{ei} = 1.06E-01 \times 0.36^{0.33} = 7.57E-02}$

$\varepsilon = 0.36$

$K_{as} = (H/K_d) \times 41$ ⇒ $H = 8.19E-02$ $\quad \boxed{K_{as} = 8.19E-02/1.14 \times 41 = 2.95}$

$K_d = 1.14 \ ml/g$

$\boxed{A = 15,676,875 \ cm^2}$

$\boxed{t = 9.07E+08 \ s}$

$$\alpha = \frac{D_{ei}\,\varepsilon}{\varepsilon + (P)(1-\varepsilon)/K_{as}} \Rightarrow \boxed{\alpha = \frac{7.57E-02 \times 0.36}{0.36 + (2.65)(1-0.36)/2.95} = 2.92E-02}$$

$$\boxed{E_i = \frac{15,676,875 \times 2 \times 7.57E-02 \times 0.36 \times 2.95 \times 1.2E-08}{\sqrt{\pi \times 2.92E-02 \times 9.07E+08}} = 3.32E-06 \ g/s}$$

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EMISSION RATE FOR XYLENES

XYLENES ⇒ MEAN BULK CONCENTRATION 33.0 ug / Kg ⇒ $\boxed{C_i = 3.3\text{E-}08 \text{ g/g}}$

$$E_i = \frac{A\, 2\, D_{ei}\, \varepsilon\, K_{as}\, C_i}{\sqrt{\pi \alpha t}}$$

$D_{ei} = D_i\, \varepsilon^{0.33}$ $D_i = 7.17\text{E-}02 \text{ cm}^2/\text{s}$
$\varepsilon = 0.36$

$\boxed{D_{ei} = 7.17\text{E-}02 \times 0.36^{0.33} = 5.12 \text{ E-}02}$

$K_{as} = (H/K_d) \times 41 \Rightarrow H = 7.04\text{E-}03 \text{ ATM m}^3/\text{MOLE}$
$K_d = 4.8 \text{ ml/g}$

$\boxed{K_{as} = (7.04\text{E-}03 / 4.8) \times 41 = 6.01 \text{ E-}02}$

$\boxed{A = 15{,}676{,}875 \text{ cm}^2}$

$\boxed{t = 9.07\text{E+}08 \text{ s}}$

$$\alpha = \frac{D_{ei}\,\varepsilon}{\varepsilon + (\rho)(1-\varepsilon)/K_{as}} \Rightarrow \boxed{\alpha = \frac{5.12\text{E-}02 \times 0.36}{0.36 + (2.65)(1-0.36)/6.01\text{E-}02} = 6.45 \text{ E-}04}$$

$$\boxed{E_i = \frac{15{,}676{,}875 \times 2 \times 5.12\text{E-}02 \times 0.36 \times 6.01\text{E-}02 \times 3.3\text{E-}08}{\sqrt{\pi \times 6.45\text{E-}04 \times 9.07\text{E+}08}} = 8.46\text{E-}07 \text{ g/s}}$$

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EMISSION RATE FOR 1,1,1-TCA

1,1,1 TCA → MEAN BULK CONCENTRATION 7.0 ug/Kg ⇒ $\boxed{C_i = 7.0\text{ E-09 } g/g}$

$$E_i = \frac{A\,2\,D_{ei}\,\varepsilon\,K_{as}\,C_i}{\sqrt{\pi \alpha t}}$$

$D_{ei} = D_i \varepsilon^{0.33}$

$D_i = 7.8\text{ E-02 } cm^2/s$

$\varepsilon = 0.36$

$\boxed{D_{ei} = 7.8\text{E-02} \times 0.36^{0.33} = 5.57\text{ E-02}}$

$K_{as} = (H/K_d) \times 41 \Rightarrow H = 1.44\text{ E-02 } ATM\ m^3/mole$

$K_d = 3.04\ ml/g$

$\boxed{K_{as} = (1.44\text{E-02}/3.04) \times 41 = 1.94\text{ E-01}}$

$\boxed{A = 15{,}676{,}875\ cm^2}$

$\boxed{t = 9.07\text{ E+08}}$

$$\alpha = \frac{D_{ei}\,\varepsilon}{\varepsilon + (\rho)(1-\varepsilon)/K_{as}} \Rightarrow \boxed{\alpha = \frac{5.57\text{E-02} \times 0.36}{0.36 + (2.65)(1-0.36)/1.94\text{ E-01}} = 2.20\text{E-03}}$$

$$\boxed{E_i = \frac{15{,}676{,}875 \times 2 \times 5.57\text{ E-02} \times 0.36 \times 1.94\text{ E-01} \times 7.0\text{ E-09}}{\sqrt{\pi \times 2.20\text{E-03} \times 9.07\text{ E+08}}} = 3.41\text{ E-07 } g/s}$$

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2.) NO SURFACE IMPOUNDMENTS OR POOLED DILUTED VOLATILES AT THE SURFACE

3.) NOT A CODISPOSAL LANDFILL

4.) NO FREE PHASE VOLATILES DIRECTLY EXPOSED

5.) SOLIDS + SEMIVOLATILES NOT A CONCERN

CALCULATION OF MAXIMUM ACTUAL IMPACT FROM NYSDEC AIR GUIDE I (1991)

$S = 130$ FEET (LENGTH OF SIDE OF AREA SOURCE)
$D = 225$ FEET (DISTANCE FROM CENTER OF THE AREA SOURCE TO THE HOMES LOCATED SOUTH OF THE SITE)
$h_A = 3$ FEET (HEIGHT OF SOURCE AREA) → FROM NYSDEC AIR GUIDE I → GROUND ELEVATION = 3 FEET

MAXIMUM ACTUAL IMPACT CALCULATION FOR TOTAL 1,2 DCE

$$C_a\ (\mu g/m^3) = \frac{104\ Q_A}{(D+S)^{1.6}\ h_A^{0.368}}$$

WHERE Q_A = ANNUAL EMISSION RATE = LB/YR

CONVERT 2.22E-06 g/s TO LB/YR

$$2.22E\text{-}06\ \frac{\text{GRAM}}{\text{SECOND}} \times 2.205E\text{-}03\ \frac{\text{LBS}}{\text{GRAM}} \times 3{,}600\ \frac{\text{SECONDS}}{\text{HOUR}} \times 24\ \frac{\text{HOURS}}{\text{DAY}} \times 365\ \frac{\text{DAYS}}{\text{YEAR}} = \boxed{Q_A = 1.54E\text{-}01\ \text{LB/YR}}$$

$$\boxed{C_a\ \frac{104 \times 1.54E\text{-}01}{(225+130)^{1.6}\ 3.0^{0.368}} = 8.88E\text{-}04\ \mu g/m^3}$$

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TOTAL 1,2 DCE

CALCULATION OF MAXIMUM POTENTIAL IMPACT FROM NYSDEC AIR GUIDE I (1991)

$$C_p \ (ug/m^3) = \frac{914{,}000 \times Q}{(0+S)^{1.6} \, h_A^{0.368}}$$

WHERE Q IS THE HOURLY EMISSION RATE IN LB/HR

$$Q = 2.22E\text{-}06 \ \frac{\text{GRAMS}}{\text{SECOND}} \times 2.205E\text{-}03 \ \frac{\text{LB}}{\text{GRAM}} \times 3600 \ \frac{\text{SECONDS}}{\text{HOUR}} = 1.76E\text{-}05 \ ug/m^3$$

$$\boxed{C_p = \frac{914{,}000 \times 1.76E\text{-}05}{(225+130)^{1.6} \, 3.0^{0.368}} = 8.92E\text{-}04 \ ug/m^3}$$

CALCULATION OF MAXIMUM SHORT TERM IMPACT, C_{ST} FROM NYSDEC AIR GUIDE I (1991)

$$C_{ST} \ ug/m^3 = C_p \times 100$$

$$\boxed{C_{ST} = 8.92E\text{-}04 \times 100 = 8.92E\text{-}02 \ ug/m^3}$$

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AREA #1

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CALCULATION OF MAXIMUM ACTUAL IMPACT FOR ETHYLBENZENE

S: 130 FEET
D: 225 FEET
h_A 3 FEET

$$C_a (ug/m^3) = \frac{104\ Q_A}{(D+S)^{1.6} h_A^{0.368}}$$

CONVERT 1.40E-07 g/s TO LB/YR

1.40 E-07 × 2.205 E-03 × 3600 × 24 × 365 = QA = 9.74 E-03

$$\boxed{C_a = \frac{104 \times 9.74E-03}{(130+225)^{1.6}\ 3.0^{0.368}} = 5.62\ E-05\ ug/m^3}$$

CALCULATION OF MAXIMUM POTENTIAL IMPACT FOR ETHYLBENZENE

$$C_p (ug/m^3) = \frac{914{,}000\ Q}{(D+S)^{1.6} h_A^{0.368}}$$

CONVERT 1.40E-07 g/s TO LB/HR

1.40 E-07 × 2.205E-03 × 3600 = 1.11 E-06 = Q

$$\boxed{C_p = \frac{914{,}000 \times 1.11E-06}{(130+225)^{1.6} \times 3^{0.368}} = 5.63E-05\ ug/m^3}$$

CALCULATION OF MAXIMUM POTENTIAL IMPACT FOR ETHYLBENZENE

$$C_{ST} (ug/m^3) = C_p \times 100$$

$$\boxed{5.63E-05 \times 100 = 5.63E-03\ ug/m^3}$$

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CALCULATION OF MAXIMUM ACTUAL IMPACT FOR TOLUENE

S = 130 FEET
D = 225 FEET
h_A = 3 FEET

$$C_a(ug/m^3) = \frac{104\,Q_a}{(D+S)^{1.6}\,h_A^{0.368}}$$

CONVERT 2.64E-06 g/s TO LB/YR

$$2.64E\text{-}06 \times 2.205E\text{-}03 \times 3600 \times 24 \times 365 = \boxed{Q_A = 1.84E\text{-}01 \text{ LB/YR}}$$

$$\boxed{C_a = \frac{104 \times 1.84E\text{-}01}{(225+130)^{1.6}\,3^{0.368}} = 1.06E\text{-}03 \text{ ug/m}^3}$$

CALCULATION OF MAXIMUM POTENTIAL IMPACT FOR TOLUENE

$$C_p(ug/m^3) = \frac{914{,}000\,Q}{(D+S)^{1.6}\,h_A^{0.368}}$$

CONVERT 2.64E-06 g/s TO LB/HR

$$2.64E\text{-}06 \times 2.205E\text{-}03 \times 3600 = Q = 2.10E\text{-}05$$

$$\boxed{C_p = \frac{914{,}000 \times 2.10E\text{-}05}{(225+130)^{1.6} \times 3^{0.368}} = 1.07E\text{-}03 \text{ ug/m}^3}$$

CALCULATION OF MAXIMUM POTENTIAL IMPACT FOR TOLUENE

$$C_{ST}(ug/m^3) = C_p \times 100 \quad \boxed{C_{ST} = 1.07E\text{-}03 \times 100 = 1.07E\text{-}01 \text{ ug/m}^3}$$

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CALCULATION OF MAXIMUM ACTUAL IMPACT FOR TRICHLOROETHENE

S = 130 FEET
D = 225 FEET
h_A = 3 FEET

$$C_a (ug/m^3) = \frac{104\, Q_A}{(D+S)^{1.6}\, h_A^{0.368}}$$

CONVERT 1.15 E-06 g/s TO LB/YR

$$1.15 E06 \times 2.205 E{-03} \times 3600 \times 24 \times 365 = Q_A = 8.00 E{-02}$$

$$\boxed{C_a = \frac{104 \times 8.00 E{-02}}{(225+130)^{1.6} \times 3^{0.368}} = 4.62 E{-04}\ ug/m^3}$$

CALCULATION OF MAXIMUM POTENTIAL IMPACT FOR TCE

$$C_P (ug/m^3) = \frac{914{,}000\, Q}{(D+S)^{1.6}\, h_A^{0.368}}$$

CONVERT 1.15 E-06 g/s TO LB/HR

$$Q = 1.15 E{-06} \times 2.205 E{-03} \times 3600 = 9.13 E{-06}\ LB/HR$$

$$\boxed{C_p = \frac{914{,}000 \times 9.13 E{-06}}{(225+130)^{1.6}\ 3^{0.368}} = 4.63 E{-04}\ ug/m^3}$$

CALCULATION OF MAXIMUM POTENTIAL IMPACT FOR TCE

$$\boxed{C_{ST} (ug/m^3) = C_p \times 100 \quad 4.63 E{-04} \times 100 = 4.63 E{-02}\ ug/m^3}$$

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CALCULATION OF MAXIMUM ACTUAL IMPACT FOR VINYL CHLORIDE

S = 130 FEET
D = 225 FEET
h_A = 3 FEET

$$C_a (ug/m^3) = \frac{104 \varphi_A}{(D+S)^{1.6} h_A^{0.368}}$$

CONVERT 3.32 E-06 g/s TO LB/YR

$$3.32E-06 \times 2.205E-03 \times 3600 \times 24 \times 365 = \boxed{\varphi_A = 2.31E-01 \text{ LB/YR}}$$

$$\boxed{C_a = \frac{104 \times 2.31E-01}{(130+225)^{1.6} \times 3^{0.368}} = 1.33E-03 \text{ ug/m}^3}$$

CALCULATION OF MAXIMUM POTENTIAL IMPACT FOR VINYL CHLORIDE

$$C_p (ug/m^3) = \frac{914{,}000\, Q}{(D+S)^{1.6} h_A^{0.368}}$$

CONVERT 3.32E-06 g/s TO LB/HR

$$Q = 3.32E-06 \times 2.205E-03 \times 3600 = 2.64E-05 \text{ LB/HR}$$

$$\boxed{C_p = \frac{914{,}000 \times 2.64E-05}{(130+225)^{1.6} \times 3^{0.368}} = 1.34E-03 \text{ ug/m3}}$$

CALCULATION OF MAXIMUM POTENTIAL IMPACT FOR VINYL CHLORIDE

$$C_{ST} (ug/m^3) = C_p \times 100$$

$$\boxed{C_{ST} = 1.34E-03 \times 100 = 1.34E-01 \text{ ug/m3}}$$

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CALCULATION OF MAXIMUM ACTUAL IMPACT FOR XYLENES

S = 130 FEET
D = 225 FEET
h_A = 3 FEET

$$C_a (ug/m^3) = \frac{104\, Q_a}{(D+S)^{1.6}\, h_A^{0.368}}$$

CONVERT 8.46E-07 g/s TO LB/YR

8.46E-07 × 2.205E-03 × 3,600 × 24 × 365 = Q_A = 5.88E-02 LB/YR

$$\boxed{C_a = \frac{104 \times 5.88E-02}{(130+225)^{1.6} \times 3^{0.368}} = 3.39\ E-04\ ug/m^3}$$

CALCULATION OF MAXIMUM POTENTIAL IMPACT FOR XYLENES

$$C_p (ug/m^3) = \frac{914{,}000\, Q}{(D+S)^{1.6}\, h_A^{0.368}}$$

CONVERT 8.46E-07 g/s TO LB/HR

8.46E-07 × 2.205E-03 × 3600 = 6.72E-06 LB/HR = Q

$$\boxed{C_p = \frac{914{,}000 \times 6.72E-06}{(130+225)^{1.6}\ 3^{0.368}} = 3.41E-04\ ug/m^3}$$

CALCULATION OF MAXIMUM POTENTIAL IMPACT FOR XYLENES

$$C_{ST} (ug/m^3) = C_p\, 100 \qquad \boxed{C_{ST} = 3.41E-04 \times 100 = 3.41E-02\ ug/m^3}$$

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CALCULATION OF MAXIMUM ACTUAL IMPACT FOR 1,1,1-TCA

S = 130 FEET
D = 225 FEET
h_A 3 FEET

$$C_a\ (ug/m^3) = \frac{104\ Q_A}{(D+S)^{1.6}\ h_A^{0.368}}$$

CONVERT 3.41E-07 g/s TO LB/YR

$$3.41\text{E-}07 \times 2.205\text{E-}03 \times 3600 \times 24 \times 365 = \boxed{Q_A = 2.37\text{E-}02\ \text{LB/YR}}$$

$$\boxed{C_a = \frac{104 \times 2.37\text{E-}02}{(225+130)^{1.6}\ 3^{0.368}} = 1.37\text{E-}04\ ug/m^3}$$

CALCULATION OF MAXIMUM POTENTIAL IMPACT FOR 1,1,1-TCA

$$C_p\ (ug/m^3) = \frac{914{,}000\,Q}{(D+S)^{1.6}\ h_A^{0.368}}$$

CONVERT 3.41E-07 g/s TO LB/HR

$$3.41\text{E-}07 \times 2.205\text{E-}03 \times 3600 = Q = 2.71\text{E-}06$$

$$C_p = \frac{914000 \times 2.71\text{E-}06}{(225+130)^{1.6} \times 3^{0.368}} = 1.37\text{E-}04$$

CALCULATION OF MAXIMUM POTENTIAL IMPACT FOR 1,1,1-TCA

$$C_{ST}\ (ug/m^3) = C_p \times 100 \Rightarrow \boxed{C_{ST} = 1.37\text{E-}04 \times 100 = 1.37\text{E-}02\ ug/m^3}$$

K

APPENDIX K

MANHOLE AND CATCHBASIN INSPECTION LOGS

M.H./C.B.# SAN - A

TABLE 1

MANHOLE/CATCHBASIN INSPECTION LOG

CLIENT: LEICA INC.

LOCATION: SUGAR RD.

DATE: 8/1/94

M.H./C.B. LOCATION: SUGAR RD.

☐ INSIDE FACILITY

☐ OUTSIDE FACILITY

TYPE OF FRAME: ☐ SQUARE ☒ CIRCULAR

TYPE OF LID: ☒ VENTED ☒ SOLID

MARKINGS ON LID: "MANHOLE

CONDITION OF FRAME: ☐ GOOD ☒ FAIR ☐ POOR

CONDITION OF LID: ☒ GOOD ☐ FAIR ☐ POOR

FRAME OPENING DIMENSION: 24"

RUNGS INSTALLED: ☒ YES ☐ NO

RUNG CONDITION: ☐ GOOD ☐ FAIR ☒ POOR

OUTGOING LINE:

	SIZE	To M.H./C.B. # or Designation	Distance	Invert Depth
#1	10"	SA - B1		10.2' BTOR

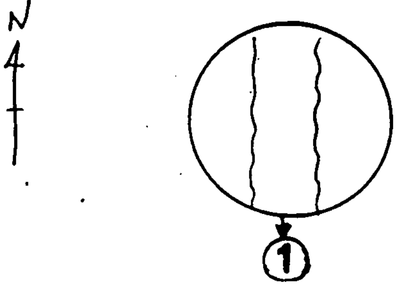
INCOMING LINE:

	SIZE	From M.H./C.B. # or Designation	Distance	Invert Depth
#2	NONE			~~10.2' BTOR~~
#3				
#4				
#5				
#6				

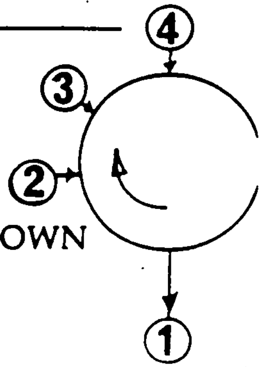
GENERAL CONDITION OF M.H./C.B.: ☒ GOOD ☐ FAIR ☐ POOR

COMMENTS: MANHOLE / SEWER BEGINS HERE. FLOWING SOUTH. MH FRAME OFFSET FROM TOP OF BRICK MANHOLE. ~1 INCH SEDIMENT. IN BOTTOM OF CHANNEL.

SKETCH:



EXAMPLE: NUMBER INCOMING LINES AS SHOWN. DRAWN IN RELATIONSHIP TO OUTGOING LINE AS SHOWN IN DIAGRAM.



M.H./~~C.B.~~# SAN B

TABLE 1

MANHOLE/CATCHBASIN INSPECTION LOG

CLIENT: LEICA INC.
LOCATION: CHEEKTOWAGA, NY

DATE: 8/1/94

M.H./C.B. LOCATION: E PARKING LOT

☐ INSIDE FACILITY
☒ OUTSIDE FACILITY

TYPE OF FRAME: ☐ SQUARE ☒ CIRCULAR

TYPE OF LID: ☒ VENTED ☐ SOLID

MARKINGS ON LID: SANITARY SEWER

CONDITION OF FRAME: ☒ GOOD ☐ FAIR ☐ POOR
CONDITION OF LID: ☒ GOOD ☐ FAIR ☐ POOR

FRAME OPENING DIMENSION: 24"

RUNGS INSTALLED: ☒ YES ☐ NO
RUNG CONDITION: ☐ GOOD ☒ FAIR ☐ POOR
TOP CORRODED, OTHERS OK

OUTGOING LINE:

	SIZE	To M.H./C.B. # or Designation	Distance	Invert Depth
#1	10"	UNKNOWN (DS OF MH B1)		8.10'

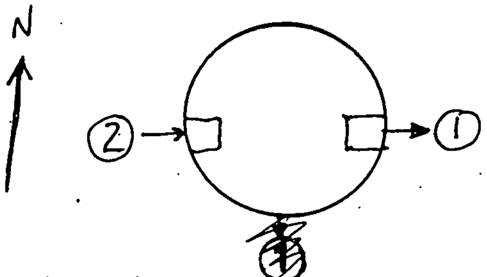
INCOMING LINE:

	SIZE	From M.H./C.B. # or Designation	Distance	Invert Depth
#2	10"	BLDG		8.10'
#3				
#4				
#5				
#6				

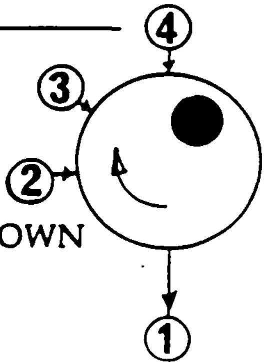
GENERAL CONDITION OF M.H./C.B.: ☒ GOOD ☐ FAIR ☐ POOR

COMMENTS: VERY LOW FLOW. NO OBSERVED CONNECTION TO MH. SAN-B1. BRICK MH

SKETCH:



EXAMPLE: NUMBER INCOMING LINES AS SHOWN. DRAWN IN RELATIONSHIP TO OUTGOING LINE AS SHOWN IN DIAGRAM.



M.H./C.B.# SAN B1

TABLE 1

MANHOLE/CATCHBASIN INSPECTION LOG

CLIENT: LEICA INC.

LOCATION: CHEEKTOWAGA

DATE: 8/1/94

M.H./C.B. LOCATION: E. PARKING LOT

☐ INSIDE FACILITY
☒ OUTSIDE FACILITY

TYPE OF FRAME: ☐ SQUARE ☒ CIRCULAR

TYPE OF LID: ☒ VENTED ☐ SOLID

MARKINGS ON LID: None

CONDITION OF FRAME: ☒ GOOD ☐ FAIR ☐ POOR
CONDITION OF LID: ☒ GOOD ☐ FAIR ☐ POOR

FRAME OPENING DIMENSION: 24"

RUNGS INSTALLED: ☒ YES ☐ NO
RUNG CONDITION: ☐ GOOD ☐ FAIR ☒ POOR

OUTGOING LINE:

	SIZE	To M.H./C.B. # or Designation	Distance	Invert Depth
#1	10"	MH SAN C		8.15'

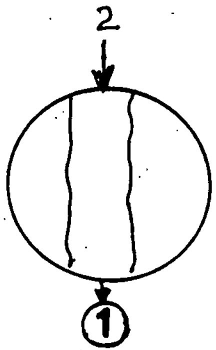
INCOMING LINE:

	SIZE	From M.H./C.B. # or Designation	Distance	Invert Depth
#2	10"	MH SAN A		8.15'
#3				
#4				
#5				
#6				

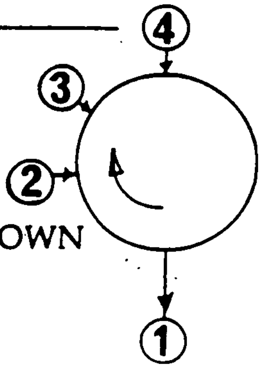
GENERAL CONDITION OF M.H./C.B.: ☒ GOOD ☐ FAIR ☐ POOR

COMMENTS: ASSUMED BLIND CONNECTION BETWEEN MH A & MH B1
VERY SLIGHT FLOW IN MH. BRICK MH

SKETCH:



EXAMPLE: NUMBER INCOMING LINES AS SHOWN. DRAWN IN RELATIONSHIP TO OUTGOING LINE AS SHOWN IN DIAGRAM.



M.H./~~C.B.~~# SAN C

TABLE 1

MANHOLE/CATCHBASIN INSPECTION LOG

CLIENT: Leica Inc

LOCATION: CHEEKTOWAGA

DATE: 8/1/94

M.H./C.B. LOCATION: S. EDGE E. PARKING LOT

☐ INSIDE FACILITY
☒ OUTSIDE FACILITY

TYPE OF FRAME: ☐ SQUARE ☒ CIRCULAR

TYPE OF LID: ☒ VENTED ☐ SOLID

MARKINGS ON LID: SEWER

CONDITION OF FRAME: ☒ GOOD ☐ FAIR ☐ POOR

CONDITION OF LID: ☒ GOOD ☐ FAIR ☐ POOR

FRAME OPENING DIMENSION: 24"

RUNGS INSTALLED: ☒ YES ☐ NO

RUNG CONDITION: ☐ GOOD ☒ FAIR ☐ POOR

OUTGOING LINE:

	SIZE	To M.H./C.B. # or Designation	Distance	Invert Depth
#1	10"			8' 5"

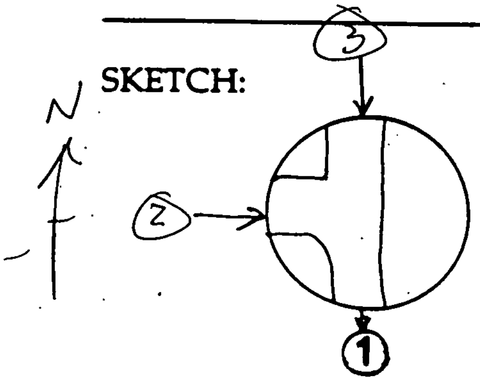
INCOMING LINE:

	SIZE	From M.H./C.B. # or Designation	Distance	Invert Depth
#2	10"	BLDG ?		8' 5"
#3	10"	MH - B1		8' 5"
#4				
#5				
#6				

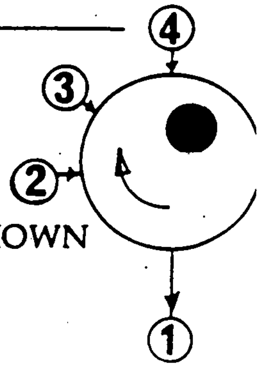
GENERAL CONDITION OF M.H./C.B.: ☐ GOOD ☐ FAIR ☐ POOR

COMMENTS: 1/2 FOOT STANDING WATER
EVIDENCE OF FLOODING
BRICK MH
LIGHT SHEEN, SEPTIC ODOR

SKETCH:



EXAMPLE: NUMBER INCOMING LINES AS SHOWN. DRAWN IN RELATIONSHIP TO OUTGOING LINE AS SHOWN IN DIAGRAM.



M.H./~~C~~B.# SAN - D

TABLE 1

MANHOLE/CATCHBASIN INSPECTION LOG

CLIENT: LEICA INC.

LOCATION: CHEEKTOWAGA

DATE: 8/1/94

M.H./C.B. LOCATION: OFFSITE AREA NORTH END

☐ INSIDE FACILITY

☒ OUTSIDE FACILITY

TYPE OF FRAME: ☐ SQUARE ☒ CIRCULAR

TYPE OF LID: ☒ VENTED ☐ SOLID

MARKINGS ON LID: —

CONDITION OF FRAME: ☐ GOOD ☒ FAIR ☐ POOR

CONDITION OF LID: ☐ GOOD ☒ FAIR ☐ POOR

FRAME OPENING DIMENSION: 24"

RUNGS INSTALLED: ☒ YES ☐ NO

RUNG CONDITION: ☐ GOOD ☒ FAIR ☐ POOR

OUTGOING LINE:

	SIZE	To M.H./C.B. # or Designation	Distance	Invert Depth
#1	10"	SAN - E		8'0"

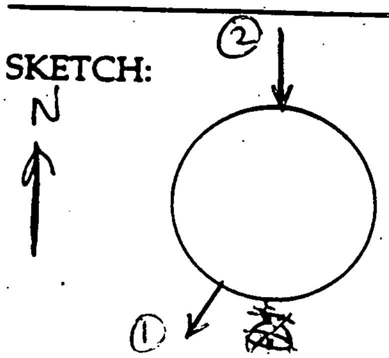
INCOMING LINE:

	SIZE	From M.H./C.B. # or Designation	Distance	Invert Depth
#2	10"	SAN C		8'0"
#3				
#4				
#5				
#6				

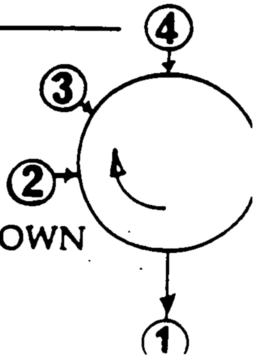
GENERAL CONDITION OF M.H./C.B.: ☒ GOOD ☐ FAIR ☐ POOR

COMMENTS: FRAME & LID BELOW GROUND LEVEL; LOW FLOW THROUGH MANHOLE; SEDIMENTS PRESENT; BRICK MH.

SKETCH:



EXAMPLE: NUMBER INCOMING LINES AS SHOWN. DRAWN IN RELATIONSHIP TO OUTGOING LINE AS SHOWN IN DIAGRAM.



M.H./~~C.B.~~# SAN - E

TABLE 1

MANHOLE/CATCHBASIN INSPECTION LOG

CLIENT: LEICA INC.

LOCATION: OFFSITE AREA NORTH END

DATE: 8/1/94

M.H./C.B. LOCATION: OFFSITE AREA CENTER PART

☐ INSIDE FACILITY
☒ OUTSIDE FACILITY

TYPE OF FRAME: ☐ SQUARE ☒ CIRCULAR

TYPE OF LID: ☒ VENTED* TARRED OVER ☐ SOLID

MARKINGS ON LID: NONE

CONDITION OF FRAME: ~~☒~~ GOOD ☒ FAIR ☐ POOR

CONDITION OF LID: ☐ GOOD ☒ FAIR ☐ POOR

FRAME OPENING DIMENSION: 24"

RUNGS INSTALLED: ☒ YES ☐ NO

RUNG CONDITION: ☐ GOOD ☐ FAIR ☒ POOR

OUTGOING LINE:

	SIZE	To M.H./C.B. # or Designation	Distance	Invert Depth
#1	10"	SAN - F		7' 5"

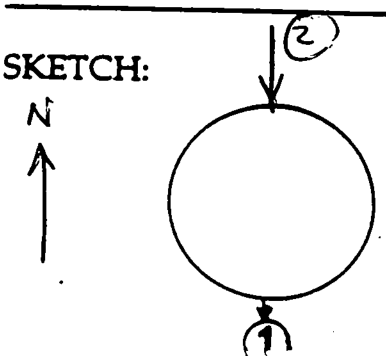
INCOMING LINE:

	SIZE	From M.H./C.B. # or Designation	Distance	Invert Depth
#2	10"	SAN-D ~~[illegible]~~		7' 5"
#3				
#4				
#5				
#6				

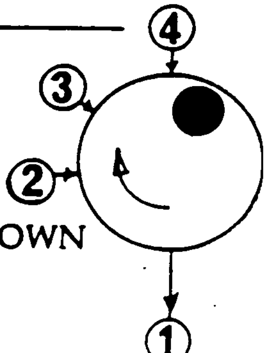
GENERAL CONDITION OF M.H./C.B.: ☐ GOOD ☒ FAIR ☐ POOR

COMMENTS: BRICK MH; RIM & COVER BELOW GROUND LEVEL OR AT GROUND LEVEL; MH SURCHARGED WITH 1.2' STANDING WATER; SEDIMENT IN MH.

SKETCH:



EXAMPLE: NUMBER INCOMING LINES AS SHOWN. DRAWN IN RELATIONSHIP TO OUTGOING LINE AS SHOWN IN DIAGRAM.



M.H./C.B.# SA-F

TABLE 1

MANHOLE/CATCHBASIN INSPECTION LOG

CLIENT: LEICA INC.
LOCATION: CHEEKTOWAGA
DATE: 8/1/94

M.H./C.B. LOCATION: CENTER OF OFFSITE AREA

☐ INSIDE FACILITY
☒ OUTSIDE FACILITY

TYPE OF FRAME: ☐ SQUARE ☒ CIRCULAR

TYPE OF LID: ☐ VENTED ☒ SOLID

MARKINGS ON LID: "STORM"

CONDITION OF FRAME: ☒ GOOD ☐ FAIR ☐ POOR
CONDITION OF LID: ☒ GOOD ☐ FAIR ☐ POOR

FRAME OPENING DIMENSION: 24"

RUNGS INSTALLED: ☒ YES ☐ NO
RUNG CONDITION: ☐ GOOD ☐ FAIR ☒ POOR

OUTGOING LINE:

	SIZE	To M.H./C.B. # or Designation	Distance	Invert Depth
#1	10"	MH-SA-G		7.4'

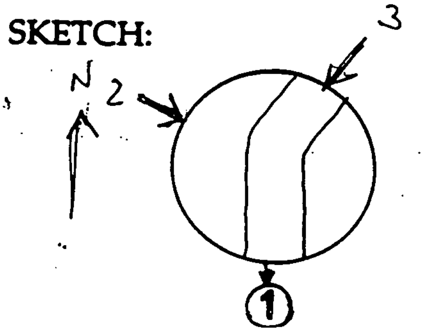
INCOMING LINE:

	SIZE	From M.H./C.B. # or Designation	Distance	Invert Depth
#2	8"	MH-SA-H		4.3'
#3	10"	MH-SA-E		7.4'
#4				
#5				
#6				

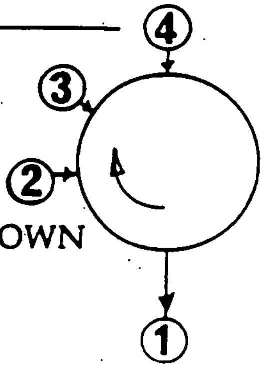
GENERAL CONDITION OF M.H./C.B.: ☒ GOOD ☐ FAIR ☐ POOR

COMMENTS: PARTLY HIDDEN BY LARGE CONCRETE CHUNK
SURCHARGED/FLOODED 1.8' Water. Brick

SKETCH:



EXAMPLE: NUMBER INCOMING LINES AS SHOWN. DRAWN IN RELATIONSHIP TO OUTGOING LINE AS SHOWN IN DIAGRAM.



M.H./~~C.B.~~# SAN-6

TABLE 1

MANHOLE/CATCHBASIN INSPECTION LOG

CLIENT: LEICA INC.

LOCATION: CHEEKTOWAGA

DATE: 8/1/94

M.H./C.B. LOCATION: ____________

☐ INSIDE FACILITY
☒ OUTSIDE FACILITY

TYPE OF FRAME: ☐ SQUARE ☒ CIRCULAR

TYPE OF LID: ☒ VENTED ☐ SOLID

MARKINGS ON LID: SEWER MANHOLE

CONDITION OF FRAME: ☒ GOOD ☐ FAIR ☐ POOR

CONDITION OF LID: ☒ GOOD ☐ FAIR ☐ POOR

FRAME OPENING DIMENSION: 24"

RUNGS INSTALLED: ☒ YES ☐ NO

RUNG CONDITION: ☐ GOOD ☐ FAIR ☒ POOR

OUTGOING LINE:

	SIZE	To M.H./C.B. # or Designation	Distance	Invert Depth
#1	10"	TOWN SYSTEM		7'8"

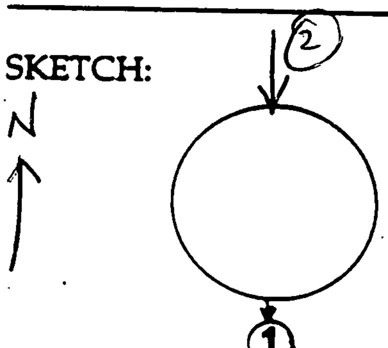
INCOMING LINE:

	SIZE	From M.H./C.B. # or Designation	Distance	Invert Depth
#2	10"	MH-SAN-F		7'5"
#3				
#4				
#5				
#6				

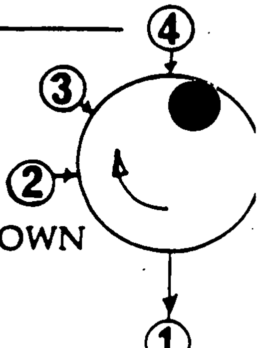
GENERAL CONDITION OF M.H./C.B.: ☒ GOOD ☐ FAIR ☐ POOR

COMMENTS: GOOD FLOW; BRICK MANHOLE; CONCRETE BOTTOM

SKETCH:



EXAMPLE: NUMBER INCOMING LINES AS SHOWN. DRAWN IN RELATIONSHIP TO OUTGOING LINE AS SHOWN IN DIAGRAM.



M.H./~~C.B.~~# SA~~N~~-H

TABLE 1

MANHOLE/CATCHBASIN INSPECTION LOG

CLIENT: LEICA INC

LOCATION: CHEEKTOWAGA

DATE: 8/1/94

M.H./C.B. LOCATION: SE CORNER OF BLDG

☐ INSIDE FACILITY
☒ OUTSIDE FACILITY

TYPE OF FRAME: ☐ SQUARE ☒ CIRCULAR

TYPE OF LID: ☒ VENTED ☐ SOLID

MARKINGS ON LID: SANITARY MH

CONDITION OF FRAME: ☒ GOOD ☐ FAIR ☐ POOR
CONDITION OF LID: ☒ GOOD ☐ FAIR ☐ POOR

FRAME OPENING DIMENSION: 24"

RUNGS INSTALLED: ☒ YES ☐ NO
RUNG CONDITION: ☐ GOOD ☒ FAIR ☐ POOR

OUTGOING LINE:

	SIZE	To M.H./C.B. # or Designation	Distance	Invert Depth
#1	8"	MH-SA-F		6'3"

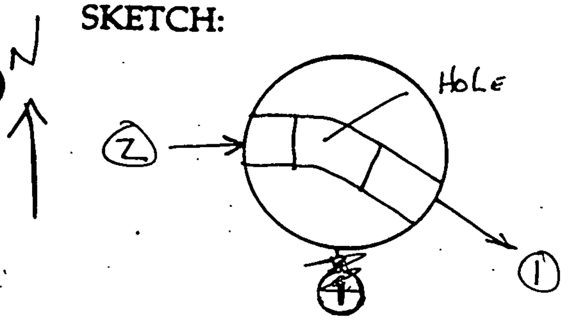
INCOMING LINE:

	SIZE	From M.H./C.B. # or Designation	Distance	Invert Depth
#2	8"	MH-SA-I		6'3"
#3				
#4				
#5				
#6				

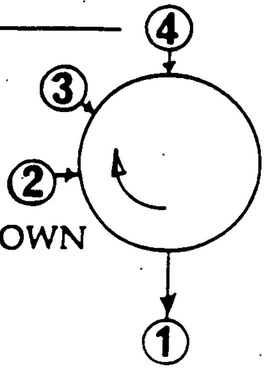
GENERAL CONDITION OF M.H./C.B.: ☒ GOOD ☐ FAIR ☐ POOR

COMMENTS: CONCRETE BRICK MH. CONCRETE FLOOR, BENCHED AREAS WET, GOOD FLOW IN PIPE.

SKETCH:



EXAMPLE: NUMBER INCOMING LINES AS SHOWN. DRAWN IN RELATIONSHIP TO OUTGOING LINE AS SHOWN IN DIAGRAM.



M.H./C.B.# SAN - I

TABLE 1

MANHOLE/CATCHBASIN INSPECTION LOG

CLIENT: LEICA INC.

DATE: 8/1/94

LOCATION: CHEEKTOWAGA

M.H./C.B. LOCATION: S. SIDE OF BLDG CENTRAL PART.

☐ INSIDE FACILITY

☐ OUTSIDE FACILITY

TYPE OF FRAME: ☐ SQUARE ☒ CIRCULAR

TYPE OF LID: ☒ VENTED ☐ SOLID

MARKINGS ON LID: SANITARY SEWER

CONDITION OF FRAME: ☒ GOOD ☐ FAIR ☐ POOR

CONDITION OF LID: ☒ GOOD ☐ FAIR ☐ POOR

FRAME OPENING DIMENSION: 24"

RUNGS INSTALLED: ☒ YES ~~☒~~ NO

RUNG CONDITION: ☐ GOOD ☐ FAIR ☒ POOR

OUTGOING LINE:

	SIZE	To M.H./C.B. # or Designation	Distance	Invert Depth
#1	8	MH - SA - H		4'9"

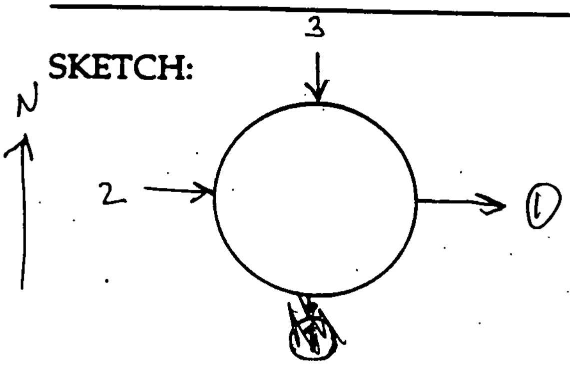
INCOMING LINE:

	SIZE	From M.H./C.B. # or Designation	Distance	Invert Depth
#2	6"	MH - SA - J		4'7"
#3	6"	BLDG		3'6"
#4				
#5				
#6				

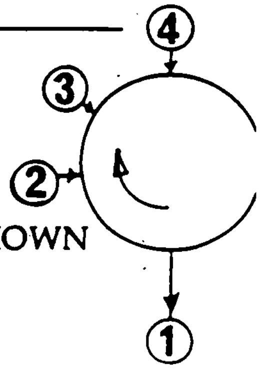
GENERAL CONDITION OF M.H./C.B.: ☒ GOOD ☐ FAIR ☐ POOR

COMMENTS: Moderate flow #3, CONCR. BRICK MH, CONCRETE FLOOR PAPER & SAN WASTE ON BENCH OPPOSITE #3

SKETCH:



EXAMPLE: NUMBER INCOMING LINES AS SHOWN. DRAWN IN RELATIONSHIP TO OUTGOING LINE AS SHOWN IN DIAGRAM.



M.H./~~C.B.~~# SA - J

TABLE 1

MANHOLE/CATCHBASIN INSPECTION LOG

CLIENT: LEICA INC

LOCATION: CHEEKTOWAGA

DATE: 8/1/94

M.H./C.B. LOCATION: Near Main Fire Pumphouse

☐ INSIDE FACILITY
☒ OUTSIDE FACILITY

TYPE OF FRAME: ☐ SQUARE ☒ CIRCULAR

TYPE OF LID: ☒ VENTED ☐ SOLID

MARKINGS ON LID: SANITARY SEWER

CONDITION OF FRAME: ☒ GOOD ☐ FAIR ☐ POOR
CONDITION OF LID: ☒ GOOD ☐ FAIR ☐ POOR

FRAME OPENING DIMENSION: 24"

RUNGS INSTALLED: ☐ YES ☒ NO
RUNG CONDITION: ☐ GOOD ☐ FAIR ☐ POOR

OUTGOING LINE:

	SIZE	To M.H./C.B. # or Designation	Distance	Invert Depth
#1	6"	MH SA - I		3' 7"

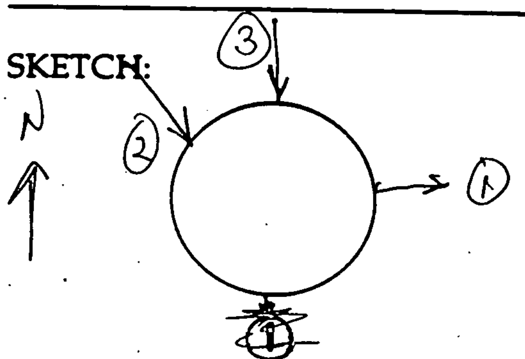
INCOMING LINE:

	SIZE	From M.H./C.B. # or Designation	Distance	Invert Depth
#2	3" PLASTIC	BLDG		3' 4"
#3	4" PVC	BLDG		2' 7"
#4				
#5				
#6				

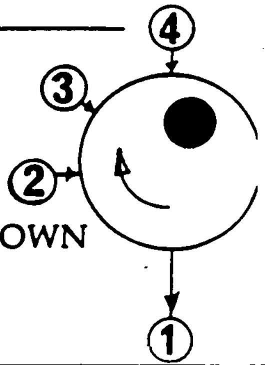
GENERAL CONDITION OF M.H./C.B.: ☐ GOOD ☐ FAIR ☐ POOR

COMMENTS: BRICK MH. MH INVERT 3' 7" Concrete bottom
Low flow from 4"

SKETCH:



EXAMPLE: NUMBER INCOMING LINES AS SHOWN. DRAWN IN RELATIONSHIP TO OUTGOING LINE AS SHOWN IN DIAGRAM.



M.H./~~C.B.~~# UNLABELED SANITARY

TABLE 1

MANHOLE/CATCHBASIN INSPECTION LOG

CLIENT: LEICA INC.

LOCATION: CHEEKTOWAGA

DATE: 8/1/94

M.H./C.B. LOCATION: E. SIDE OF BLDG Near Fire Shed

☐ INSIDE FACILITY
☐ OUTSIDE FACILITY

TYPE OF FRAME: ☐ SQUARE ☒ CIRCULAR

TYPE OF LID: ☐ VENTED ☒ SOLID

MARKINGS ON LID: STORM SEWER

CONDITION OF FRAME: ☒ GOOD ☐ FAIR ☐ POOR

CONDITION OF LID: ☒ GOOD ☐ FAIR ☐ POOR

FRAME OPENING DIMENSION: 24"

RUNGS INSTALLED: ☒ YES ~~☒~~ NO

RUNG CONDITION: ☒ GOOD ☐ FAIR ☐ POOR

OUTGOING LINE:

	SIZE	To M.H./C.B. # or Designation	Distance	Invert Depth
#1	4" VT	Unknown		5'4"

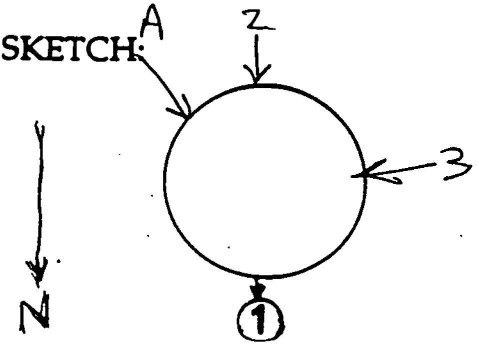
INCOMING LINE:

	SIZE	From M.H./C.B. # or Designation	Distance	Invert Depth
#2	6" VT	BATHROOMS		5'3"
#3	6" VT	BATHROOMS		4'10"
A ~~#4~~	3" PVC	FIRE PUMPHOUSE		5'2"
#5				
#6				

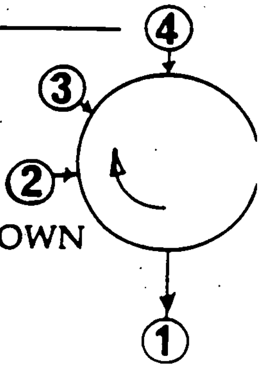
GENERAL CONDITION OF M.H./C.B.: ☒ GOOD ☐ FAIR ☐ POOR

COMMENTS: Newer MH - ALUM RUNGS, CONCRETE NO FLOW. BOTTOM WET

SKETCH:



EXAMPLE: NUMBER INCOMING LINES AS SHOWN. DRAWN IN RELATIONSHIP TO OUTGOING LINE AS SHOWN IN DIAGRAM.



M.H./~~C.B.~~# MH STM-A

TABLE 1

MANHOLE/CATCHBASIN INSPECTION LOG

CLIENT: Leica Inc.

LOCATION: Cheektowaga

DATE: 8/1/94

M.H./C.B. LOCATION: Sugar Rd.

☐ INSIDE FACILITY
☒ OUTSIDE FACILITY

TYPE OF FRAME: ☐ SQUARE ☒ CIRCULAR

TYPE OF LID: ☒ VENTED ☐ SOLID

MARKINGS ON LID: NONE

CONDITION OF FRAME: ☒ GOOD ☐ FAIR ☐ POOR
CONDITION OF LID: ☒ GOOD ☐ FAIR ☐ POOR

FRAME OPENING DIMENSION: 24"

RUNGS INSTALLED: ☐ YES ☒ NO
RUNG CONDITION: ☐ GOOD ☐ FAIR ☐ POOR

OUTGOING LINE:

	SIZE	To M.H./C.B. # or Designation	Distance	Invert Depth
#1	30"	MH STM-B		9'6"

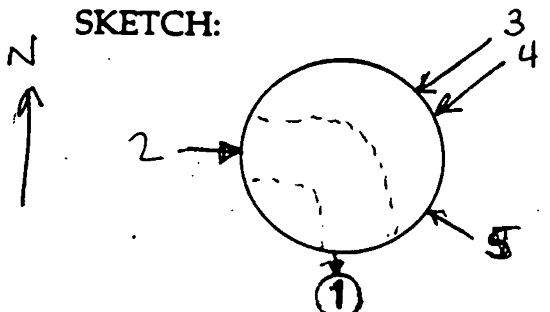
INCOMING LINE:

	SIZE	From M.H./C.B. # or Designation	Distance	Invert Depth
#2	24"	SUGAR RD SYSTEM (W)		9'6"
#3	20"	SUGAR RD SYSTEM (E)		8'
#4	12" +/-	SUGAR RD CATCH BASINS		4'6"
#5	16" +/-	SUGAR RD CATCH BASINS		4'6"
#6				

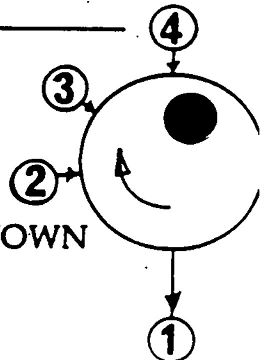
GENERAL CONDITION OF M.H./C.B.: ☒ GOOD ☐ FAIR ☐ POOR

COMMENTS: Low flow from W.; Brick MH.; concrete bottom

SKETCH:



EXAMPLE: NUMBER INCOMING LINES AS SHOWN. DRAWN IN RELATIONSHIP TO OUTGOING LINE AS SHOWN IN DIAGRAM.



M.H./~~CB~~# STM-B

TABLE 1

MANHOLE/CATCHBASIN INSPECTION LOG

CLIENT: LEICA INC.
LOCATION: CHEEK
DATE: 8/1/94

M.H./C.B. LOCATION: E PARKING LOT
☐ INSIDE FACILITY
☒ OUTSIDE FACILITY

TYPE OF FRAME: ☐ SQUARE ☒ CIRCULAR

TYPE OF LID: ☒ VENTED ☐ SOLID

MARKINGS ON LID: ~~[illegible]~~ NONE

CONDITION OF FRAME: ☒ GOOD ☐ FAIR ☐ POOR
CONDITION OF LID: ☒ GOOD ☐ FAIR ☐ POOR

FRAME OPENING DIMENSION: 24"

RUNGS INSTALLED: ☐ YES ☒ NO
RUNG CONDITION: ☐ GOOD ☐ FAIR ☐ POOR

OUTGOING LINE:

	SIZE	To M.H./C.B. # or Designation	Distance	Invert Depth
#1	30"	STM C		6' 10"

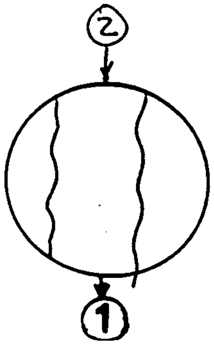
INCOMING LINE:

	SIZE	From M.H./C.B. # or Designation	Distance	Invert Depth
#2	30"	STM A		6' 10"
#3				
#4				
#5				
#6				

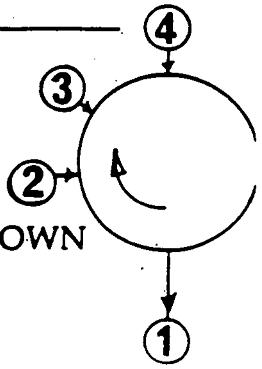
GENERAL CONDITION OF M.H./C.B.: ☒ GOOD ☐ FAIR ☐ POOR

COMMENTS: CONC. TILE 30". 1 to 2" SED. LOW FLOW.
BRICK MH.

SKETCH:



EXAMPLE: NUMBER INCOMING LINES AS SHOWN. DRAWN IN RELATIONSHIP TO OUTGOING LINE AS SHOWN IN DIAGRAM.



M.H./~~C.B.~~# STM-C

TABLE 1

MANHOLE/CATCHBASIN INSPECTION LOG

CLIENT: LEICA INC

LOCATION: CHEEKTOWAGA

DATE: 8/1/94

M.H./C.B. LOCATION: CENTER OF EAST PARKING RD.

☐ INSIDE FACILITY

☒ OUTSIDE FACILITY

TYPE OF FRAME: ☐ SQUARE ☒ CIRCULAR

TYPE OF LID: ☒ VENTED ☐ SOLID

MARKINGS ON LID: STORM SEWER

CONDITION OF FRAME: ☒ GOOD ☐ FAIR ☐ POOR

CONDITION OF LID: ☒ GOOD ☐ FAIR ☐ POOR

FRAME OPENING DIMENSION: 24"

RUNGS INSTALLED: ☐ YES ☒ NO

RUNG CONDITION: ☐ GOOD ☐ FAIR ☐ POOR

OUTGOING LINE:

	SIZE	To M.H./C.B. # or Designation	Distance	Invert Depth
#1	30"	MH ST D		7' 3½"

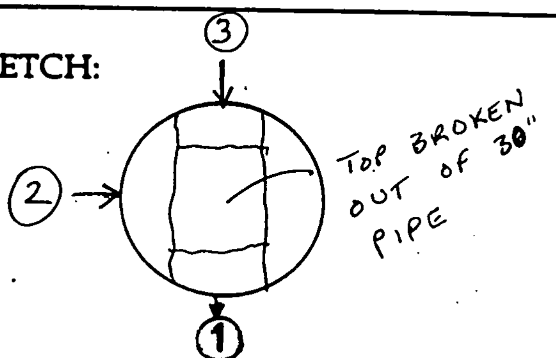
INCOMING LINE:

	SIZE	From M.H./C.B. # or Designation	Distance	Invert Depth
#2	20"	BLDG		6' 3½"
#3	30"	MH ST B		7' 3½"
#4				
#5				
#6				

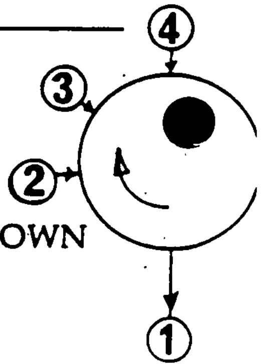
GENERAL CONDITION OF M.H./C.B.: ☒ GOOD ☐ FAIR ☐ POOR

COMMENTS: CONCR. PIPE, BRICK MH,
3 to # 1 STAGNANT
2 LOW FLOW

SKETCH:



EXAMPLE: NUMBER INCOMING LINES AS SHOWN. DRAWN IN RELATIONSHIP TO OUTGOING LINE AS SHOWN IN DIAGRAM.



M.H./~~C.B.~~# STM - D

TABLE 1

MANHOLE/CATCHBASIN INSPECTION LOG

CLIENT: LEICA INC

LOCATION: CHEEKTOWAGA

DATE: 8/1/94

M.H./C.B. LOCATION: SOUTH EDGE OF EAST PARKING LOT.

☐ INSIDE FACILITY
☒ OUTSIDE FACILITY

TYPE OF FRAME: ☐ SQUARE ☒ CIRCULAR

TYPE OF LID: ☐ VENTED ☒ SOLID

MARKINGS ON LID: NONE

CONDITION OF FRAME: ☒ GOOD ☐ FAIR ☐ POOR
CONDITION OF LID: ☒ GOOD ☐ FAIR ☐ POOR

FRAME OPENING DIMENSION: 36"

RUNGS INSTALLED: ☐ YES ☒ NO
RUNG CONDITION: ☐ GOOD ☐ FAIR ☐ POOR

OUTGOING LINE:

	SIZE	To M.H./C.B. # or Designation		Distance	Invert Depth
#1	30"	STM E	Concrete		6'6"

INCOMING LINE:

	SIZE	From M.H./C.B. # or Designation		Distance	Invert Depth
#2	20"	Building	TILE		5'10"
#3	16"	Building	TILE		6' 0"
#4	8"	CB #4	CMP		2'6"
#5	30"	STM C	CONCRETE		6'6"
#6	8"	CB # 2 & CB # 3	TILE		3'2"

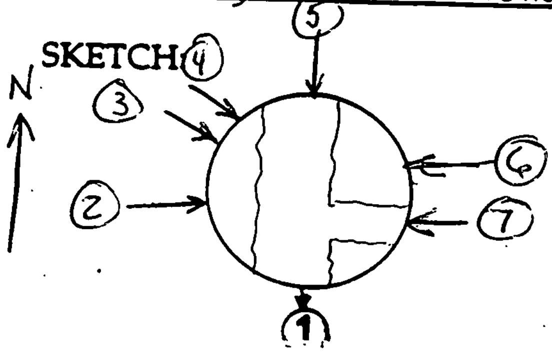
GENERAL CONDITION OF M.H./C.B.: ☒ GOOD ☐ FAIR ☐ POOR

COMMENTS:

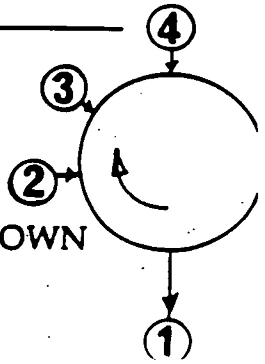
#7 6" Catch basins? Tile 6'3"

Some fine to coarse sediments in MH; Brick MH; No Flow; Concrete bottom.

SKETCH:



EXAMPLE: NUMBER INCOMING LINES AS SHOWN. DRAWN IN RELATIONSHIP TO OUTGOING LINE AS SHOWN IN DIAGRAM.



M.H./~~C.B.~~# STM-E

TABLE 1

MANHOLE/CATCHBASIN INSPECTION LOG

CLIENT: Leica Inc.

LOCATION: Cheektowaga

DATE: 8/1/94

M.H./~~C.B.~~ LOCATION: Offsite Area North End

☐ INSIDE FACILITY
☒ OUTSIDE FACILITY

TYPE OF FRAME: ☐ SQUARE ☒ CIRCULAR

TYPE OF LID: ☒ VENTED ☐ SOLID

MARKINGS ON LID: Storm

CONDITION OF FRAME: ☒ GOOD ☐ FAIR ☐ POOR

CONDITION OF LID: ☒ GOOD ☐ FAIR ☐ POOR

FRAME OPENING DIMENSION: 24"

RUNGS INSTALLED: ☐ YES ☒ NO

RUNG CONDITION: ☐ GOOD ☐ FAIR ☐ POOR

OUTGOING LINE:

	SIZE	To M.H./C.B. # or Designation	Distance	Invert Depth
#1	30"	STM-F		5'6"

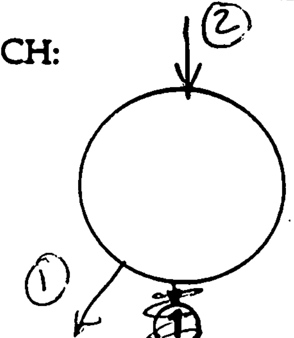
INCOMING LINE:

	SIZE	From M.H./C.B. # or Designation	Distance	Invert Depth
#2	30"	STM-D		5'6"
#3				
#4				
#5				
#6				

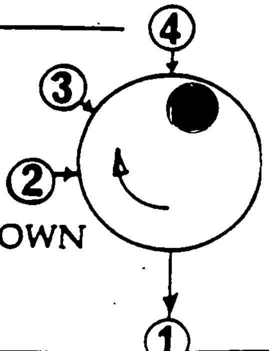
GENERAL CONDITION OF M.H./C.B.: ☒ GOOD ☐ FAIR ☐ POOR

COMMENTS: Manhole surcharged with 1 foot (+/-) standing water; Brick manhole;

SKETCH:



EXAMPLE: NUMBER INCOMING LINES AS SHOWN. DRAWN IN RELATIONSHIP TO OUTGOING LINE AS SHOWN IN DIAGRAM.



M.H./~~C.B.~~# STM-F

TABLE 1

MANHOLE/CATCHBASIN INSPECTION LOG

CLIENT: Leica Inc.

LOCATION: CHEEKTOWAGA

DATE: 8/1/94

M.H./C.B. LOCATION: OFFSITE AREA CENTER PART

☐ INSIDE FACILITY ☒ OUTSIDE FACILITY

TYPE OF FRAME: ☐ SQUARE ☒ CIRCULAR

TYPE OF LID: ☒ VENTED ☐ SOLID

MARKINGS ON LID: None

CONDITION OF FRAME: ☒ GOOD ☐ FAIR ☐ POOR

CONDITION OF LID: ☒ GOOD ☐ FAIR ☐ POOR

FRAME OPENING DIMENSION: 24"

RUNGS INSTALLED: ☐ YES ☒ NO

RUNG CONDITION: ☐ GOOD ☐ FAIR ☐ POOR

OUTGOING LINE:

	SIZE	To M.H./C.B. # or Designation	Distance	Invert Depth
#1	30"	STM-G		5'3"

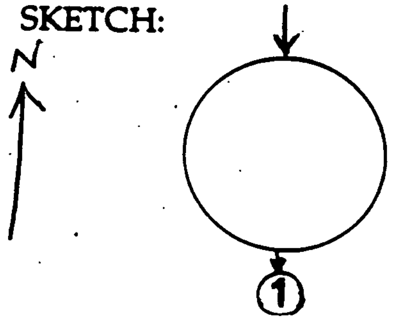
INCOMING LINE:

	SIZE	From M.H./C.B. # or Designation	Distance	Invert Depth
#2	30"	STM-E		5'3"
#3				
#4				
#5				
#6				

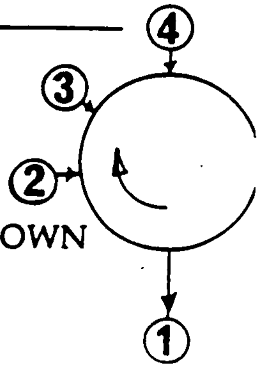
GENERAL CONDITION OF M.H./C.B.: ☒ GOOD ☐ FAIR ☐ POOR

COMMENTS: SURCHARGED WITH 1.3' STANDING WATER
Some Sediments in bottom of pipe. Brick Manhole

SKETCH:



EXAMPLE: NUMBER INCOMING LINES AS SHOWN. DRAWN IN RELATIONSHIP TO OUTGOING LINE AS SHOWN IN DIAGRAM.



M.H./~~C.B.~~# STM-6

TABLE 1

MANHOLE/CATCHBASIN INSPECTION LOG

CLIENT: LEICA INC.

LOCATION: CHEEKTOWAGA

DATE: 8/1/94

M.H./C.B. LOCATION: ROWAN & PRESTON

☐ INSIDE FACILITY
☐ OUTSIDE FACILITY

TYPE OF FRAME: ☐ SQUARE ☒ CIRCULAR

TYPE OF LID: ☒ VENTED ☐ SOLID

MARKINGS ON LID: McCoy ; CANADA ; STORM

CONDITION OF FRAME: ☒ GOOD ☐ FAIR ☐ POOR

CONDITION OF LID: ☒ GOOD ☐ FAIR ☐ POOR

FRAME OPENING DIMENSION: 24"

RUNGS INSTALLED: ☒ YES ☐ NO

RUNG CONDITION: ☒ GOOD ☐ FAIR ☐ POOR

OUTGOING LINE:

	SIZE	To M.H./C.B. # or Designation	Distance	Invert Depth
#1	30"	CHEEKTOWAGA SYSTEM Concrete		5'6"

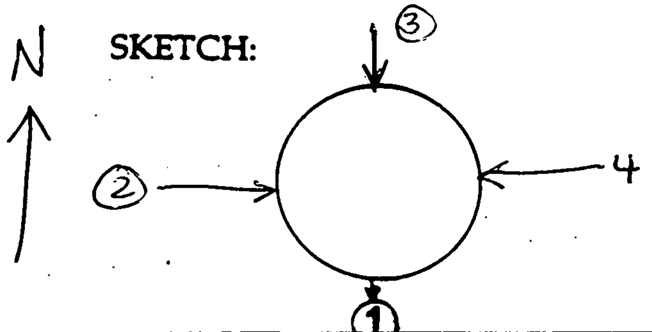
INCOMING LINE:

	SIZE	From M.H./C.B. # or Designation	Distance	Invert Depth
#2	24"	ROWAN RD (WEST) TILE		5'2"
#3	30"	STM-F CONCRETE		5'3"
#4	24"	ROWAN RD (EAST) TILE		5'3"
#5				
#6				

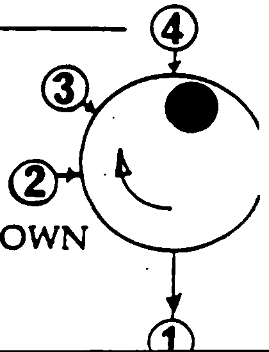
GENERAL CONDITION OF M.H./C.B.: ☐ GOOD ☐ FAIR ☐ POOR

COMMENTS: IN CENTER OF ROAD; BRICK MH; CEMENT BOTTOM; LOW FLOW;

SKETCH:



EXAMPLE: NUMBER INCOMING LINES AS SHOWN. DRAWN IN RELATIONSHIP TO OUTGOING LINE AS SHOWN IN DIAGRAM.



M.H. ~~CB~~# ~~3~~ STA-H

TABLE 1

MANHOLE/CATCHBASIN INSPECTION LOG

CLIENT: LEICA INC

LOCATION: CHEEKTOWAGA

DATE: 8/1/94

M.H./C.B. LOCATION: SW CORNER E. PARKING LOT

☐ INSIDE FACILITY
☒ OUTSIDE FACILITY

TYPE OF FRAME: ☐ SQUARE ☒ CIRCULAR

TYPE OF LID: ☐ VENTED ☒ SOLID

MARKINGS ON LID: ~~None~~ SEWER

CONDITION OF FRAME: ☒ GOOD ☐ FAIR ☐ POOR

CONDITION OF LID: ☒ GOOD ☐ FAIR ☐ POOR

FRAME OPENING DIMENSION: 24"

RUNGS INSTALLED: ☐ YES ☒ NO

RUNG CONDITION: ☐ GOOD ☐ FAIR ☐ POOR

OUTGOING LINE:

	SIZE	To M.H./C.B. # or Designation	Distance	Invert Depth
#1	24"	MH ST. D VIT TILE		5'9"

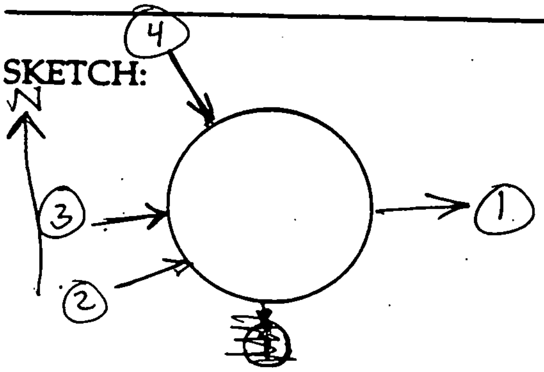
INCOMING LINE:

	SIZE	From M.H./C.B. # or Designation	Distance	Invert Depth
#2	16"	ST-I MH VIT TILE		5'10"
#3	16"	ST-J MH VIT TILE		5'10"
#4	8"	CB W SIDE E. LOT. TILE		3' 0"
#5				
#6				

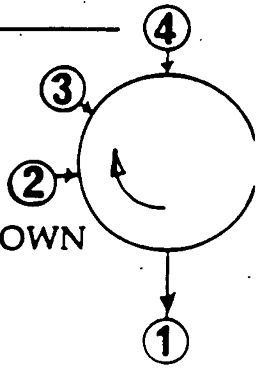
GENERAL CONDITION OF M.H./C.B.: ☐ GOOD ☐ FAIR ☐ POOR

COMMENTS: MH INVERT 6.0' ; 4" STANDING WATER
BRICK MH. SLOW DRIP FROM 8"

SKETCH:



EXAMPLE: NUMBER INCOMING LINES AS SHOWN. DRAWN IN RELATIONSHIP TO OUTGOING LINE AS SHOWN IN DIAGRAM.



M.H./~~C.B.~~# STM-I

TABLE 1

MANHOLE/CATCHBASIN INSPECTION LOG

CLIENT: Leica Inc.

LOCATION: Cheektowaga

DATE: 8/1/94

M.H./C.B. LOCATION: E. Side of Bldg

☐ INSIDE FACILITY
☒ OUTSIDE FACILITY

TYPE OF FRAME: ☐ SQUARE ☒ CIRCULAR

TYPE OF LID: ☐ VENTED ☐ SOLID

MARKINGS ON LID:

CONDITION OF FRAME: ☒ GOOD ☐ FAIR ☐ POOR
CONDITION OF LID: ☒ GOOD ☐ FAIR ☐ POOR

FRAME OPENING DIMENSION: 24"

RUNGS INSTALLED: ☐ YES ☐ NO
RUNG CONDITION: ☐ GOOD ☐ FAIR ☐ POOR

OUTGOING LINE:

	SIZE	To M.H./C.B. # or Designation	Distance	Invert Depth
#1	16"	ST H		8'9"

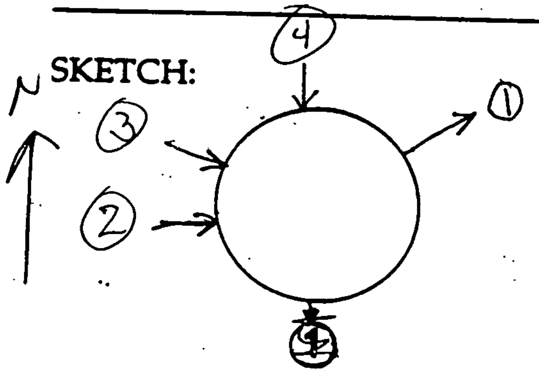
INCOMING LINE:

	SIZE	From M.H./C.B. # or Designation	Distance	Invert Depth
#2	10" or 12"	BLDG; FIRE PUMPHOUSE		8'7"
#3	3" PVC	VAULT (BLOWDOWN VAULT		1'3"
#4	4" CI			1'10"
#5				
#6				

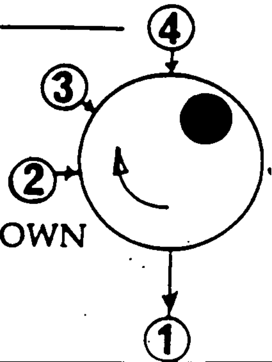
GENERAL CONDITION OF M.H./C.B.: ☐ GOOD ☐ FAIR ☐ POOR

COMMENTS:

SKETCH:



EXAMPLE: NUMBER INCOMING LINES AS SHOWN. DRAWN IN RELATIONSHIP TO OUTGOING LINE AS SHOWN IN DIAGRAM.



M.H./~~C.B.~~# STA-J

TABLE 1

MANHOLE/CATCHBASIN INSPECTION LOG

CLIENT: LEICA INC.
LOCATION: CHEEKTOWAGA

DATE: 8/1/94

M.H./C.B. LOCATION: E. SIDE OF BLDG

☐ INSIDE FACILITY
☒ OUTSIDE FACILITY

TYPE OF FRAME: ☐ SQUARE ☐ CIRCULAR

TYPE OF LID: ☐ VENTED ☐ SOLID

MARKINGS ON LID: ______

CONDITION OF FRAME: ☐ GOOD ☐ FAIR ☐ POOR
CONDITION OF LID: ☐ GOOD ☐ FAIR ☐ POOR

FRAME OPENING DIMENSION: ______

RUNGS INSTALLED: ☐ YES ☐ NO
RUNG CONDITION: ☐ GOOD ☐ FAIR ☐ POOR

OUTGOING LINE:

	SIZE	To M.H./C.B. # or Designation	Distance	Invert Depth
#1				

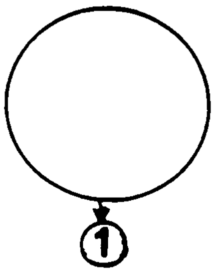
INCOMING LINE:

	SIZE	From M.H./C.B. # or Designation	Distance	Invert Depth
#2				
#3				
#4				
#5				
#6				

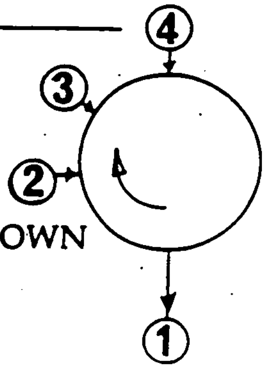
GENERAL CONDITION OF M.H./C.B.: ☐ GOOD ☐ FAIR ☐ POOR

COMMENTS: UNABLE TO LOCATE – LARGE AMOUNT OF GATES, SHELVES, etc. STORED IN AREA.

SKETCH:



EXAMPLE: NUMBER INCOMING LINES AS SHOWN. DRAWN IN RELATIONSHIP TO OUTGOING LINE AS SHOWN IN DIAGRAM.



M.H./~~C.B.~~# STM - K

TABLE 1

MANHOLE/CATCHBASIN INSPECTION LOG

CLIENT: LEICA INC.

LOCATION: CHEEKTOWAGA

DATE: 8/1/94

M.H./C.B. LOCATION: EGGERT RD NORTH OF S. PARKING LOT EXIT

☐ INSIDE FACILITY
☒ OUTSIDE FACILITY

TYPE OF FRAME: ☐ SQUARE ☒ CIRCULAR

TYPE OF LID: ☐ VENTED ☒ SOLID

MARKINGS ON LID: —

CONDITION OF FRAME: ☒ GOOD ☐ FAIR ☐ POOR

CONDITION OF LID: ☒ GOOD ☐ FAIR ☐ POOR

FRAME OPENING DIMENSION: 24"

RUNGS INSTALLED: ☐ YES ☒ NO

RUNG CONDITION: ☐ GOOD ☐ FAIR ☐ POOR

OUTGOING LINE:

	SIZE	To M.H./C.B. # or Designation	Distance	Invert Depth
#1	20" VT	ONTO PROPERTY		4'6"

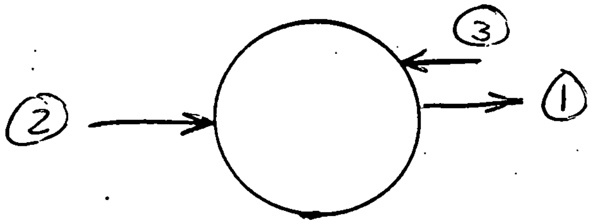
INCOMING LINE:

	SIZE	From M.H./C.B. # or Designation	Distance	Invert Depth
#2	20" VT	EGGERT RD CATCHBASINS		4'5"
#3	4" CMP	UNKNOWN		2'6"
#4				
#5				
#6				

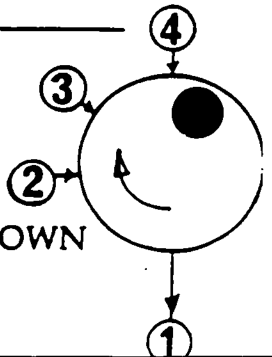
GENERAL CONDITION OF M.H./C.B.: ☐ GOOD ☐ FAIR ☐ POOR

COMMENTS: 20" IS DROP PIPE FOR CATCH BASINS IN S. PARKING LOT; FLOW SOUNDS APPARENT FROM 20" TO EAST; OUTLET FOR 20" UNKNOWN;

SKETCH:



EXAMPLE: NUMBER INCOMING LINES AS SHOWN. DRAWN IN RELATIONSHIP TO OUTGOING LINE AS SHOWN IN DIAGRAM.



M.H./~~C.B.~~# STM-1

TABLE 1

MANHOLE/CATCHBASIN INSPECTION LOG

CLIENT: Leica Inc
LOCATION: Cheektowaga

DATE: 8/1/94

M.H./~~C.B.~~ LOCATION: Rowan & Ivanhoe

☐ INSIDE FACILITY
☐ OUTSIDE FACILITY

TYPE OF FRAME: ☐ SQUARE ☒ CIRCULAR

TYPE OF LID: ☒ VENTED ☐ SOLID

MARKINGS ON LID: McCoy Canada Storm

CONDITION OF FRAME: ☒ GOOD ☐ FAIR ☐ POOR
CONDITION OF LID: ☒ GOOD ☐ FAIR ☐ POOR

FRAME OPENING DIMENSION: 24"

RUNGS INSTALLED: ☒ YES ☐ NO
RUNG CONDITION: ☒ GOOD ☐ FAIR ☐ POOR

OUTGOING LINE:

	SIZE	To M.H./C.B. # or Designation	Distance	Invert Depth
#1	12"	Cheektowaga System		5'2"

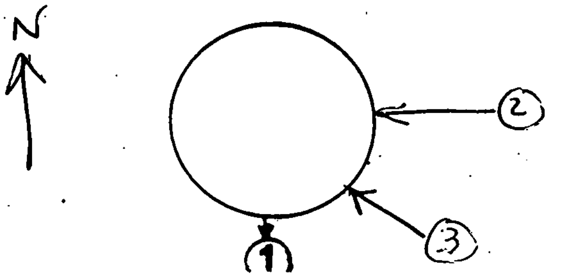
INCOMING LINE:

	SIZE	From M.H./C.B. # or Designation	Distance	Invert Depth
#2	10"	Rowan		3'2"
#3	10"	Catch Basins at Intersection		3'0"
#4				
#5				
#6				

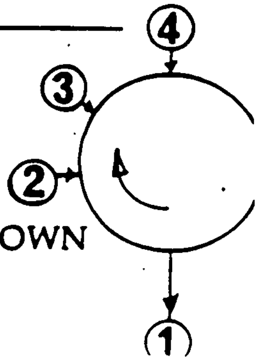
GENERAL CONDITION OF M.H./C.B.: ☐ GOOD ☐ FAIR ☐ POOR

COMMENTS: No incoming from Leica Inc.; No Flow; Manhole dead-ends to northward; Brick Manhole; Concrete bottom

SKETCH:



EXAMPLE: NUMBER INCOMING LINES AS SHOWN. DRAWN IN RELATIONSHIP TO OUTGOING LINE AS SHOWN IN DIAGRAM.



~~M.H.~~/C.B.# 1

TABLE 1

MANHOLE/CATCHBASIN INSPECTION LOG

CLIENT: LEICA INC

LOCATION: CHEEKTOWAGA

DATE: 8/1/94

~~M.H.~~/C.B. LOCATION: CENTER OF E. PARKING LOT

☐ INSIDE FACILITY

☒ OUTSIDE FACILITY

TYPE OF FRAME: ☒ SQUARE ☐ CIRCULAR

TYPE OF LID: ☒ VENTED ☐ SOLID

MARKINGS ON LID: —

CONDITION OF FRAME: ☒ GOOD ☐ FAIR ☐ POOR

CONDITION OF LID: ☒ GOOD ☐ FAIR ☐ POOR

FRAME OPENING DIMENSION: 26"

RUNGS INSTALLED: ☐ YES ☒ NO

RUNG CONDITION: ☐ GOOD ☐ FAIR ☐ POOR

OUTGOING LINE:

	SIZE	To M.H./C.B. # or Designation	Distance	Invert Depth
#1	UNKNOWN			

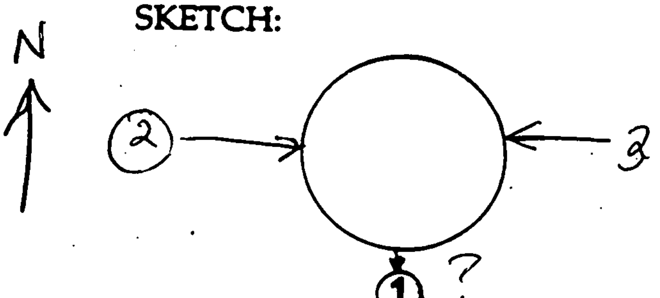
INCOMING LINE:

	SIZE	From M.H./C.B. # or Designation	Distance	Invert Depth
#2	3"	WEST (unknown)		1'6"
#3	3"	EAST (unknown)		1'8"
#4				
#5				
#6				

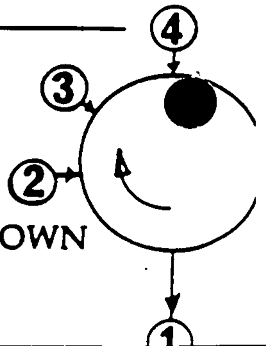
GENERAL CONDITION OF M.H./C.B.: ☒ GOOD ☐ FAIR ☐ POOR

COMMENTS: Bottom 54" deep; Sediments to 38" below top; Outlet cannot be seen.

SKETCH:



EXAMPLE: NUMBER INCOMING LINES AS SHOWN. DRAWN IN RELATIONSHIP TO OUTGOING LINE AS SHOWN IN DIAGRAM.



~~M.H.~~/C.B.# 2
2

TABLE 1

MANHOLE/CATCHBASIN INSPECTION LOG

CLIENT: LEICA INC
LOCATION: CHEEKTOWAGA
DATE: 8/1/94

M.H./C.B. LOCATION: SE CORNER E. PARKING

☐ INSIDE FACILITY
☒ OUTSIDE FACILITY

TYPE OF FRAME: ☐ SQUARE ☒ CIRCULAR

TYPE OF LID: ☒ VENTED ☐ SOLID

MARKINGS ON LID: NONE

CONDITION OF FRAME: ☒ GOOD ☐ FAIR ☐ POOR
CONDITION OF LID: ☒ GOOD ☐ FAIR ☐ POOR

FRAME OPENING DIMENSION: 30"

RUNGS INSTALLED: ☐ YES ☒ NO
RUNG CONDITION: ☐ GOOD ☐ FAIR ☐ POOR

OUTGOING LINE:

	SIZE	To M.H./C.B. # or Designation	Distance	Invert Depth
#1	8"	UNKNOWN		23"

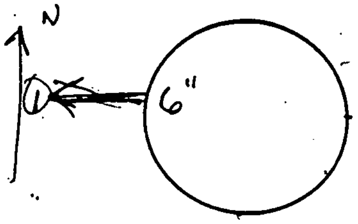
INCOMING LINE:

	SIZE	From M.H./C.B. # or Designation	Distance	Invert Depth
#2	NONE			
#3				
#4				
#5				
#6				

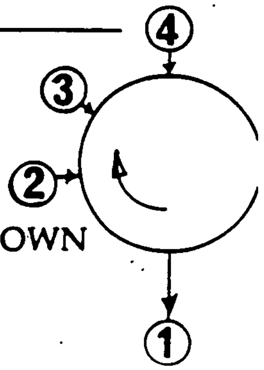
GENERAL CONDITION OF M.H./C.B.: ☒ GOOD ☐ FAIR ☐ POOR

COMMENTS: CB INVERT 33"

SKETCH:



EXAMPLE: NUMBER INCOMING LINES AS SHOWN. DRAWN IN RELATIONSHIP TO OUTGOING LINE AS SHOWN IN DIAGRAM.



~~M.H.~~/C.B.# 3

TABLE 1

MANHOLE/CATCHBASIN INSPECTION LOG

CLIENT: LEICA INC

LOCATION: CHEEKTOWAGA

DATE: 8/1/94

M.H./C.B. LOCATION: S. CENTER E. PARKING LOT

☐ INSIDE FACILITY
☒ OUTSIDE FACILITY

TYPE OF FRAME: ☐ SQUARE ☒ CIRCULAR

TYPE OF LID: ☒ VENTED ☐ SOLID

MARKINGS ON LID: None

CONDITION OF FRAME: ☒ GOOD ☐ FAIR ☐ POOR
CONDITION OF LID: ☒ GOOD ☐ FAIR ☐ POOR

FRAME OPENING DIMENSION: 30"

RUNGS INSTALLED: ☐ YES ☒ NO
RUNG CONDITION: ☐ GOOD ☐ FAIR ☐ POOR

OUTGOING LINE:

	SIZE	To M.H./C.B. # or Designation	Distance	Invert Depth
#1	8"			27"

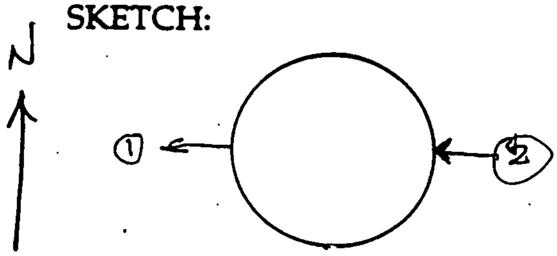
INCOMING LINE:

	SIZE	From M.H./C.B. # or Designation	Distance	Invert Depth
#2	8"	CB # 2		18"
#3				
#4				
#5				
#6				

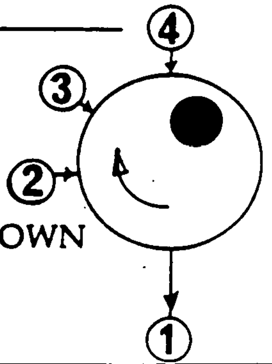
GENERAL CONDITION OF M.H./C.B.: ☒ GOOD ☐ FAIR ☐ POOR

COMMENTS: MH INVERT 32"

SKETCH:



EXAMPLE: NUMBER INCOMING LINES AS SHOWN. DRAWN IN RELATIONSHIP TO OUTGOING LINE AS SHOWN IN DIAGRAM.



~~M.H.~~/C.B.# 4

TABLE 1

MANHOLE/CATCHBASIN INSPECTION LOG

CLIENT: LEICA INC.
LOCATION: CHEEKTOWAGA

DATE: 8/1/94

~~M.H.~~/C.B. LOCATION: CENTER, SOUTH SIDE OF E. PARKING LOT

☐ INSIDE FACILITY
☒ OUTSIDE FACILITY

TYPE OF FRAME: ☒ SQUARE ☐ CIRCULAR

TYPE OF LID: ☒ VENTED ☐ SOLID

MARKINGS ON LID: —

CONDITION OF FRAME: ☒ GOOD ☐ FAIR ☐ POOR
CONDITION OF LID: ☒ GOOD ☐ FAIR ☐ POOR

FRAME OPENING DIMENSION: 26"

RUNGS INSTALLED: ☐ YES ☒ NO
RUNG CONDITION: ☐ GOOD ☐ FAIR ☐ POOR

OUTGOING LINE:

	SIZE	To M.H./C.B. # or Designation	Distance	Invert Depth
#1	6"	MH - STM - D CMP		1'8"

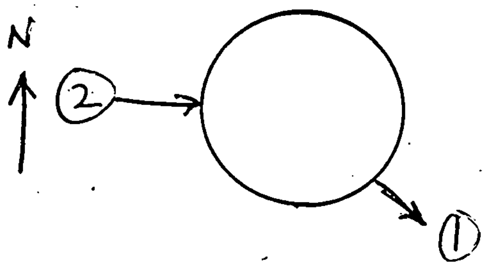
INCOMING LINE:

	SIZE	From M.H./C.B. # or Designation	Distance	Invert Depth
#2	6"	CB #5 VT.		1'9"
#3				
#4				
#5				
#6				

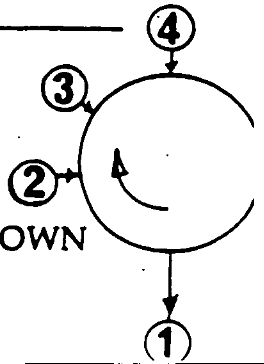
GENERAL CONDITION OF M.H./C.B.: ☒ GOOD ☐ FAIR ☐ POOR

COMMENTS: Concrete walls (precast); 27" deep (2'3"); some sediment;

SKETCH:



EXAMPLE: NUMBER INCOMING LINES AS SHOWN. DRAWN IN RELATIONSHIP TO OUTGOING LINE AS SHOWN IN DIAGRAM.



~~M.H.~~/C.B.# 5

TABLE 1

MANHOLE/CATCHBASIN INSPECTION LOG

CLIENT: LEICA INC

LOCATION: CHEEKTOWAGA

DATE: 8/1/94

~~M.H.~~/C.B. LOCATION: SW CORNER OF E. PARKING LOT

☐ INSIDE FACILITY
☒ OUTSIDE FACILITY

TYPE OF FRAME: ☐ SQUARE ☒ CIRCULAR

TYPE OF LID: ☐ VENTED ☐ SOLID

MARKINGS ON LID: —

CONDITION OF FRAME: ☒ GOOD ☐ FAIR ☐ POOR

CONDITION OF LID: ☐ GOOD ☐ FAIR ☒ POOR

FRAME OPENING DIMENSION: 29"

RUNGS INSTALLED: ☐ YES ☐ NO

RUNG CONDITION: ☐ GOOD ☐ FAIR ☐ POOR

OUTGOING LINE:

	SIZE	To M.H./C.B. # or Designation	Distance	Invert Depth
#1	8"	STM-H or drop pipe		1' 10"

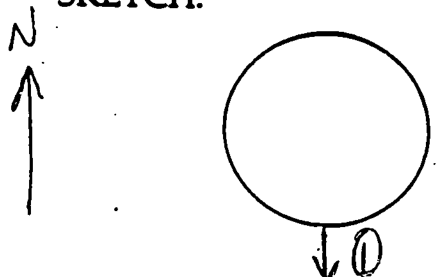
INCOMING LINE:

	SIZE	From M.H./C.B. # or Designation	Distance	Invert Depth
#2				
#3				
#4				
#5				
#6				

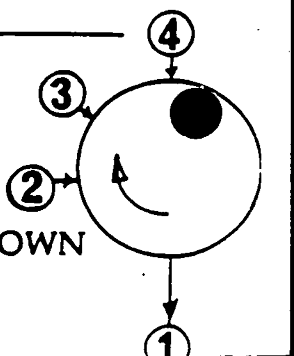
GENERAL CONDITION OF M.H./C.B.: ☐ GOOD ☒ FAIR ☐ POOR

COMMENTS: LID CRACKED BUT STABLE; SOME COARSE SEDIMENTS; Vitreous Tile Sides; 28" depth invert

SKETCH:



EXAMPLE: NUMBER INCOMING LINES AS SHOWN. DRAWN IN RELATIONSHIP TO OUTGOING LINE AS SHOWN IN DIAGRAM.



~~MH~~./C.B.# 6

TABLE 1

MANHOLE/CATCHBASIN INSPECTION LOG

CLIENT: LEICA INC.

LOCATION: CHEEKTOWAGA

DATE: 8/1/94

M.H./C.B. LOCATION: EAST OF SOUTH LOADING DOCKS

☐ INSIDE FACILITY
☒ OUTSIDE FACILITY

TYPE OF FRAME: ☒ SQUARE ☐ CIRCULAR

TYPE OF LID: ☒ VENTED ☐ SOLID

MARKINGS ON LID: —

CONDITION OF FRAME: ☒ GOOD ☐ FAIR ☐ POOR
CONDITION OF LID: ☒ GOOD ☐ FAIR ☐ POOR

FRAME OPENING DIMENSION: 26"

RUNGS INSTALLED: ☐ YES ☒ NO
RUNG CONDITION: ☐ GOOD ☐ FAIR ☐ POOR

OUTGOING LINE:

	SIZE	To M.H./C.B. # or Designation	Distance	Invert Depth
#1	6"	South (unknown)		3' 4"

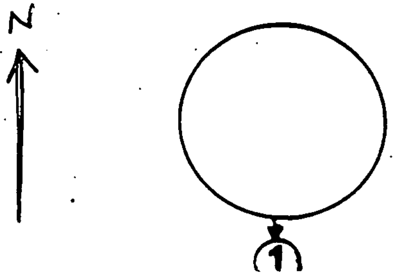
INCOMING LINE:

	SIZE	From M.H./C.B. # or Designation	Distance	Invert Depth
#2				
#3				
#4				
#5				
#6				

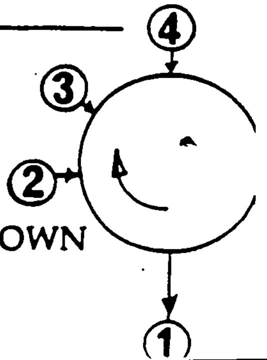
GENERAL CONDITION OF M.H./C.B.: ☒ GOOD ☐ FAIR ☐ POOR

COMMENTS: Invert is 3' 7" ; Concrete sides & bottom

SKETCH:



EXAMPLE: NUMBER INCOMING LINES AS SHOWN. DRAWN IN RELATIONSHIP TO OUTGOING LINE AS SHOWN IN DIAGRAM.



M.H./C.B.# 7

TABLE 1

MANHOLE/CATCHBASIN INSPECTION LOG

CLIENT: LEICA INC

LOCATION: CHEEKTOWAGA

DATE: 8/1/94

M.H./C.B. LOCATION: Near Gate East of North Loading Docks

☐ INSIDE FACILITY
☒ OUTSIDE FACILITY

TYPE OF FRAME: ☐ SQUARE ☒ CIRCULAR

TYPE OF LID: ☐ VENTED ☐ SOLID

MARKINGS ON LID:

CONDITION OF FRAME: ☒ GOOD ☐ FAIR ☐ POOR
CONDITION OF LID: ☒ GOOD ☐ FAIR ☐ POOR

FRAME OPENING DIMENSION: 21"

RUNGS INSTALLED: ☐ YES ☐ NO
RUNG CONDITION: ☐ GOOD ☐ FAIR ☐ POOR

OUTGOING LINE:

	SIZE	To M.H./C.B. # or Designation	Distance	Invert Depth
#1	4"	EAST (CB#24) TILE		1'3"

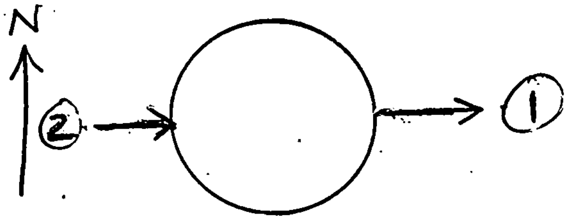
INCOMING LINE:

	SIZE	From M.H./C.B. # or Designation	Distance	Invert Depth
#2	4"	WEST (UNKNOWN) PVC		1'7"
#3				
#4				
#5				
#6				

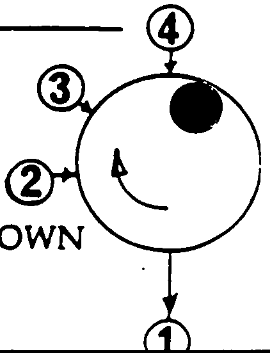
GENERAL CONDITION OF M.H./C.B.: ☒ GOOD ☐ FAIR ☐ POOR

COMMENTS: Vitreous tile Sides; Invert is 1'8";

SKETCH:



EXAMPLE: NUMBER INCOMING LINES AS SHOWN. DRAWN IN RELATIONSHIP TO OUTGOING LINE AS SHOWN IN DIAGRAM.



M.H./C.B.# 8

TABLE 1

MANHOLE/CATCHBASIN INSPECTION LOG

CLIENT: LEICA INC.

LOCATION: CHEEKTOWAGA

DATE: 8/1/94

~~M.H.~~/C.B. LOCATION: IN GRASS IN SW CORNER OF SITE

☐ INSIDE FACILITY
☒ OUTSIDE FACILITY

TYPE OF FRAME: ☐ SQUARE ☒ CIRCULAR

TYPE OF LID: ☒ VENTED ☐ SOLID

MARKINGS ON LID: —

CONDITION OF FRAME: ☒ GOOD ☐ FAIR ☐ POOR

CONDITION OF LID: ☒ GOOD ☐ FAIR ☐ POOR

FRAME OPENING DIMENSION: 23"

RUNGS INSTALLED: ☐ YES ☒ NO

RUNG CONDITION: ☐ GOOD ☐ FAIR ☐ POOR

OUTGOING LINE:

	SIZE	To M.H./C.B. # or Designation	Distance	Invert Depth
#1	4"	DROP PIPE		1'0"

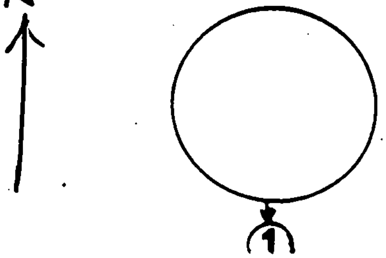
INCOMING LINE:

	SIZE	From M.H./C.B. # or Designation	Distance	Invert Depth
#2				
#3				
#4				
#5				
#6				

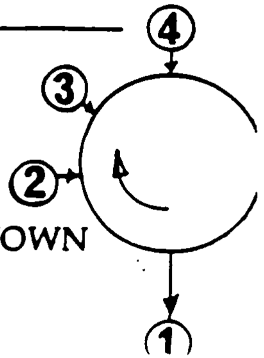
GENERAL CONDITION OF M.H./C.B.: ☒ GOOD ☐ FAIR ☐ POOR

COMMENTS: VITREOUS TILE SIDES; 1'3" INVERT; Sediments Flow sounds apparent from 4" pipe; some sediments in bottom

SKETCH:



EXAMPLE: NUMBER INCOMING LINES AS SHOWN. DRAWN IN RELATIONSHIP TO OUTGOING LINE AS SHOWN IN DIAGRAM.



M.H./C.B.# 9

TABLE 1

MANHOLE/CATCHBASIN INSPECTION LOG

CLIENT: LEICA INC

LOCATION: CHEEKTOWAGA

DATE: 8/1/94

~~M.H.~~/C.B. LOCATION: IN GRASS IN SW CORNER OF SITE

☐ INSIDE FACILITY
☒ OUTSIDE FACILITY

TYPE OF FRAME: ☐ SQUARE ☒ CIRCULAR

TYPE OF LID: ☒ VENTED ☐ SOLID

MARKINGS ON LID: —

CONDITION OF FRAME: ☒ GOOD ☐ FAIR ☐ POOR
CONDITION OF LID: ☒ GOOD ☐ FAIR ☐ POOR

FRAME OPENING DIMENSION: 18"

RUNGS INSTALLED: ☐ YES ☒ NO
RUNG CONDITION: ☐ GOOD ☐ FAIR ☐ POOR

OUTGOING LINE:

	SIZE	To M.H./C.B. # or Designation	Distance	Invert Depth
#1	3"	South (drop pipe)		1'2"

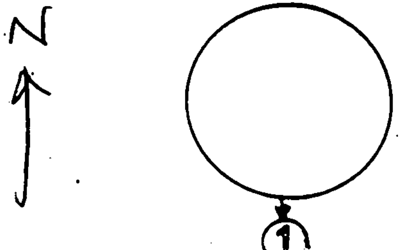
INCOMING LINE:

	SIZE	From M.H./C.B. # or Designation	Distance	Invert Depth
#2				
#3				
#4				
#5				
#6				

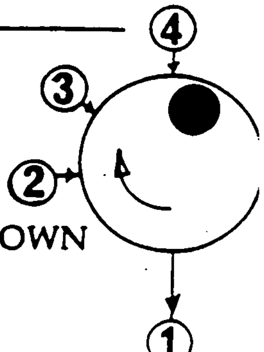
GENERAL CONDITION OF M.H./C.B.: ☒ GOOD ☐ FAIR ☐ POOR

COMMENTS: INVERT 1'2"; Vitreous tile Sides; Flow sounds apparent from 3" pipe

SKETCH:



EXAMPLE: NUMBER INCOMING LINES AS SHOWN. DRAWN IN RELATIONSHIP TO OUTGOING LINE AS SHOWN IN DIAGRAM.



~~M.H.~~/C.B.# 10

TABLE 1

MANHOLE/CATCHBASIN INSPECTION LOG

CLIENT: Leica Inc

LOCATION: Cheektowaga

DATE: 8/1/94

~~M.H.~~/C.B. LOCATION: Exit To Eggert Rd. From S. Parking Lot.

☐ INSIDE FACILITY
☒ OUTSIDE FACILITY

TYPE OF FRAME: ☒ SQUARE ☐ CIRCULAR

TYPE OF LID: ☒ VENTED ☐ SOLID

MARKINGS ON LID: —

CONDITION OF FRAME: ☒ GOOD ☐ FAIR ☐ POOR
CONDITION OF LID: ☒ GOOD ☐ FAIR ☐ POOR

FRAME OPENING DIMENSION: 20"

RUNGS INSTALLED: ☐ YES ☒ NO
RUNG CONDITION: ☐ GOOD ☐ FAIR ☐ POOR

OUTGOING LINE:

	SIZE	To M.H./C.B. # or Designation	Distance	Invert Depth
#1	8"	North (Drop Pipe)		2' 11"

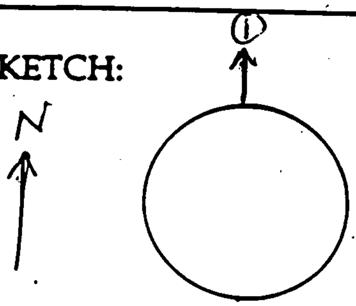
INCOMING LINE:

	SIZE	From M.H./C.B. # or Designation	Distance	Invert Depth
#2				
#3				
#4				
#5				
#6				

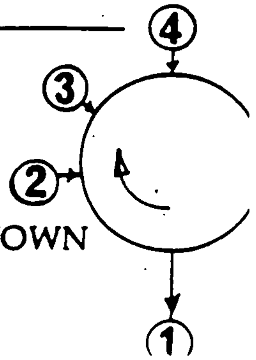
GENERAL CONDITION OF M.H./C.B.: ☒ GOOD ☐ FAIR ☐ POOR

COMMENTS: Concrete Structure; 3'1" invert; Flow sounds from 8" pipe;

SKETCH:



EXAMPLE: NUMBER INCOMING LINES AS SHOWN. DRAWN IN RELATIONSHIP TO OUTGOING LINE AS SHOWN IN DIAGRAM.



~~M.H.~~/C.B.# 11

TABLE 1

MANHOLE/CATCHBASIN INSPECTION LOG

CLIENT: LEICA INC

LOCATION: CHEEKTOWAGA

DATE: 8/1/94

M.H./C.B. LOCATION: EXIT TO EGGERT RD. FROM S. PARKING LOT.

☐ INSIDE FACILITY
☒ OUTSIDE FACILITY

TYPE OF FRAME: ☒ SQUARE ☐ CIRCULAR

TYPE OF LID: ☒ VENTED ☐ SOLID

MARKINGS ON LID: ~

CONDITION OF FRAME: ☒ GOOD ☐ FAIR ☐ POOR
CONDITION OF LID: ☒ GOOD ☐ FAIR ☐ POOR

FRAME OPENING DIMENSION: 20"

RUNGS INSTALLED: ☐ YES ☒ NO
RUNG CONDITION: ☐ GOOD ☐ FAIR ☐ POOR

OUTGOING LINE:

	SIZE	To M.H./C.B. # or Designation	Distance	Invert Depth
#1	8"	NORTH (DROP PIPE)		2' 11"

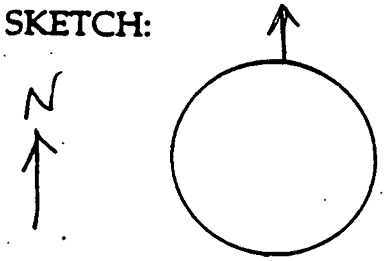
INCOMING LINE:

	SIZE	From M.H./C.B. # or Designation	Distance	Invert Depth
#2				
#3				
#4				
#5				
#6				

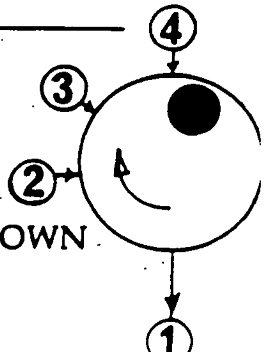
GENERAL CONDITION OF M.H./C.B.: ☒ GOOD ☐ FAIR ☐ POOR

COMMENTS: 3'3" Invert; Concrete Structure; Flow sounds apparent from 8" pipe.

SKETCH:



EXAMPLE: NUMBER INCOMING LINES AS SHOWN. DRAWN IN RELATIONSHIP TO OUTGOING LINE AS SHOWN IN DIAGRAM.



~~M.H.~~/C.B.# 12

TABLE 1

MANHOLE/CATCHBASIN INSPECTION LOG

CLIENT: Leica Inc.

LOCATION: CHEEKTOWAGA

DATE: 8/1/94

~~M.H.~~/C.B. LOCATION: Exit To Eggert Rd, From S. Parking Lot

☐ INSIDE FACILITY
☐ OUTSIDE FACILITY

TYPE OF FRAME: ☒ SQUARE ☐ CIRCULAR

TYPE OF LID: ☒ VENTED ☐ SOLID

MARKINGS ON LID: —

CONDITION OF FRAME: ☒ GOOD ☐ FAIR ☐ POOR
CONDITION OF LID: ☒ GOOD ☐ FAIR ☐ POOR

FRAME OPENING DIMENSION: 20"

RUNGS INSTALLED: ☐ YES ☒ NO
RUNG CONDITION: ☐ GOOD ☐ FAIR ☐ POOR

OUTGOING LINE:

	SIZE	To M.H./C.B. # or Designation	Distance	Invert Depth
#1	8"	NORTH (Drop Pipe)		3' 5"

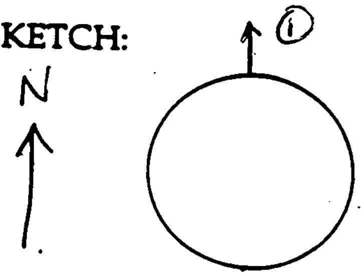
INCOMING LINE:

	SIZE	From M.H./C.B. # or Designation	Distance	Invert Depth
#2				
#3				
#4				
#5				
#6				

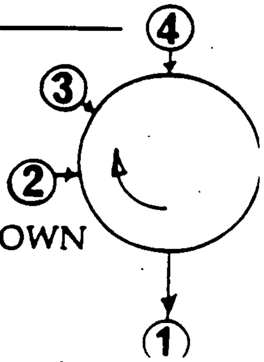
GENERAL CONDITION OF M.H./C.B.: ☒ GOOD ☐ FAIR ☐ POOR

COMMENTS: Invert 3'9"; CONCRETE STRUCTURE; FLOW SOUNDS APPARENT FROM 8" PIPE; Some Sediment in Bottom

SKETCH:



EXAMPLE: NUMBER INCOMING LINES AS SHOWN. DRAWN IN RELATIONSHIP TO OUTGOING LINE AS SHOWN IN DIAGRAM.



~~M.H.~~/C.B.# 13

TABLE 1

MANHOLE/CATCHBASIN INSPECTION LOG

CLIENT: LEICA INC.

LOCATION: CHEEKTOWAGA

DATE: 8/1/94

M.H./C.B. LOCATION: SOUTH PARKING LOT NEAR EXIT TO EGGERT RD.

☐ INSIDE FACILITY
☒ OUTSIDE FACILITY

TYPE OF FRAME: ☒ SQUARE ☐ CIRCULAR

TYPE OF LID: ☒ VENTED ☐ SOLID

MARKINGS ON LID: —

CONDITION OF FRAME: ☒ GOOD ☐ FAIR ☐ POOR
CONDITION OF LID: ☒ GOOD ☐ FAIR ☐ POOR

FRAME OPENING DIMENSION: 26"

RUNGS INSTALLED: ☐ YES ☒ NO
RUNG CONDITION: ☐ GOOD ☐ FAIR ☐ POOR

OUTGOING LINE:

	SIZE	To M.H./C.B. # or Designation	Distance	Invert Depth
#1	8"	South (Drop pipe)		3' 0"

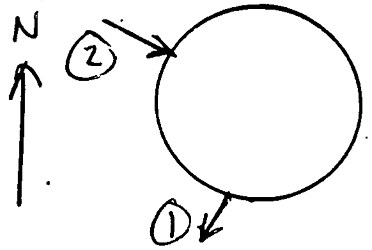
INCOMING LINE:

	SIZE	From M.H./C.B. # or Designation	Distance	Invert Depth
#2	4"	Fire Pumphouse		2' 5"
#3				
#4				
#5				
#6				

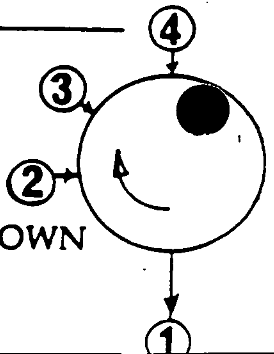
GENERAL CONDITION OF M.H./C.B.: ☒ GOOD ☐ FAIR ☐ POOR

COMMENTS: INVERT 3'9"; CONCRETE STRUCTURE; Constant flow from 4" pipe

SKETCH:



EXAMPLE: NUMBER INCOMING LINES AS SHOWN. DRAWN IN RELATIONSHIP TO OUTGOING LINE AS SHOWN IN DIAGRAM.



M.H./C.B.# 14

TABLE 1

MANHOLE/CATCHBASIN INSPECTION LOG

CLIENT: Leica Inc
LOCATION: Cheektowaga

DATE: 8/1/94

M.H./C.B. LOCATION: South Parking Lot Along South Fence

☐ INSIDE FACILITY
☒ OUTSIDE FACILITY

TYPE OF FRAME: ☒ SQUARE ☐ CIRCULAR

TYPE OF LID: ☒ VENTED ☐ SOLID

MARKINGS ON LID: —

CONDITION OF FRAME: ☒ GOOD ☐ FAIR ☐ POOR
CONDITION OF LID: ☒ GOOD ☐ FAIR ☐ POOR

FRAME OPENING DIMENSION: 20"

RUNGS INSTALLED: ☐ YES ☒ NO
RUNG CONDITION: ☐ GOOD ☐ FAIR ☐ POOR

OUTGOING LINE:

	SIZE	To M.H./C.B. # or Designation	Distance	Invert Depth
#1	8"	North (Drop Pipe)		2'9"

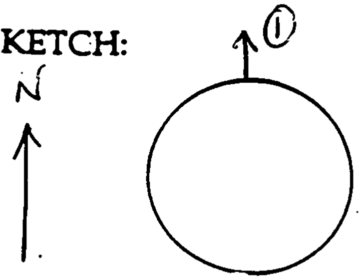
INCOMING LINE:

	SIZE	From M.H./C.B. # or Designation	Distance	Invert Depth
#2				
#3				
#4				
#5				
#6				

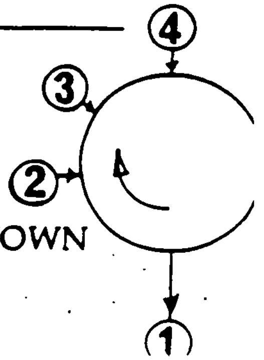
GENERAL CONDITION OF M.H./C.B.: ☒ GOOD ☐ FAIR ☐ POOR

COMMENTS: Invert is 3'5" ; Concrete structure ; some Sediment ;

SKETCH:



EXAMPLE: NUMBER INCOMING LINES AS SHOWN. DRAWN IN RELATIONSHIP TO OUTGOING LINE AS SHOWN IN DIAGRAM.



~~M.H.~~/C.B.# 15

TABLE 1

MANHOLE/CATCHBASIN INSPECTION LOG

CLIENT: Leica Inc

LOCATION: Cheektowaga

DATE: 8/1/94

M.H./C.B. LOCATION: South Parking Lot Along South Fence

☐ INSIDE FACILITY

☒ OUTSIDE FACILITY

TYPE OF FRAME: ☒ SQUARE ☐ CIRCULAR

TYPE OF LID: ☒ VENTED ☐ SOLID

MARKINGS ON LID: —

CONDITION OF FRAME: ☒ GOOD ☐ FAIR ☐ POOR

CONDITION OF LID: ☒ GOOD ☐ FAIR ☐ POOR

FRAME OPENING DIMENSION: 20"

RUNGS INSTALLED: ☐ YES ☒ NO

RUNG CONDITION: ☐ GOOD ☐ FAIR ☐ POOR

OUTGOING LINE:

	SIZE	To M.H./C.B. # or Designation	Distance	Invert Depth
#1	8	North (Drop Pipe)		2' 8"

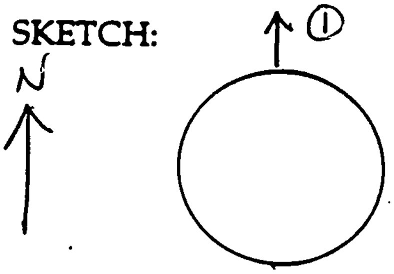
INCOMING LINE:

	SIZE	From M.H./C.B. # or Designation	Distance	Invert Depth
#2				
#3				
#4				
#5				
#6				

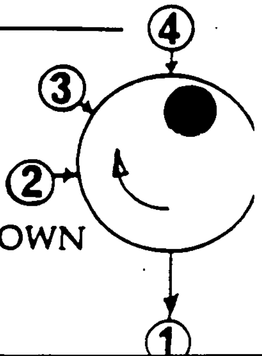
GENERAL CONDITION OF M.H./C.B.: ☒ GOOD ☐ FAIR ☐ POOR

COMMENTS: Invert 3'4" ; some sediments; concrete Structure;

SKETCH:



EXAMPLE: NUMBER INCOMING LINES AS SHOWN. DRAWN IN RELATIONSHIP TO OUTGOING LINE AS SHOWN IN DIAGRAM.



~~M.H.~~/C.B.# 16

TABLE 1

MANHOLE/CATCHBASIN INSPECTION LOG

CLIENT: Leica Inc.

LOCATION: CHEEKTOWAGA

DATE: 8/1/94

M.H./C.B. LOCATION: South Parking Lot Along South Fence

☐ INSIDE FACILITY
☒ OUTSIDE FACILITY

TYPE OF FRAME: ☒ SQUARE ☐ CIRCULAR

TYPE OF LID: ☒ VENTED ☐ SOLID

MARKINGS ON LID: —

CONDITION OF FRAME: ☒ GOOD ☐ FAIR ☐ POOR
CONDITION OF LID: ☒ GOOD ☐ FAIR ☐ POOR

FRAME OPENING DIMENSION: 20"

RUNGS INSTALLED: ☐ YES ☒ NO
RUNG CONDITION: ☐ GOOD ☐ FAIR ☐ POOR

OUTGOING LINE:

	SIZE	To M.H./C.B. # or Designation	Distance	Invert Depth
#1	8	North (Drop Pipe)		2'6"

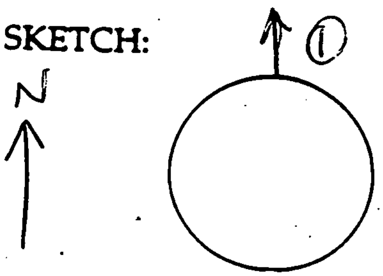
INCOMING LINE:

	SIZE	From M.H./C.B. # or Designation	Distance	Invert Depth
#2				
#3				
#4				
#5				
#6				

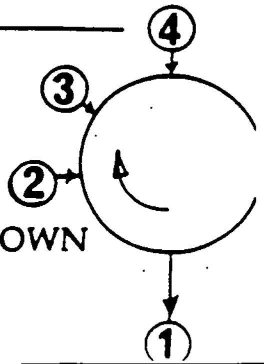
GENERAL CONDITION OF M.H./C.B.: ☐ GOOD ☐ FAIR ☐ POOR

COMMENTS: Concrete structure; some sediments; Invert 3'7"

SKETCH:



EXAMPLE: NUMBER INCOMING LINES AS SHOWN. DRAWN IN RELATIONSHIP TO OUTGOING LINE AS SHOWN IN DIAGRAM.



~~M.H.~~/C.B.# 17

TABLE 1

MANHOLE/CATCHBASIN INSPECTION LOG

CLIENT: Leica Inc.

DATE: 8/1/94

LOCATION: CHEEKTOWAGA

M.H./C.B. LOCATION: SE CORNER OF S. PARKING LOT

☐ INSIDE FACILITY
☒ OUTSIDE FACILITY

TYPE OF FRAME: ☒ SQUARE ☐ CIRCULAR

TYPE OF LID: ☒ VENTED ☐ SOLID

MARKINGS ON LID: —

CONDITION OF FRAME: ☒ GOOD ☐ FAIR ☐ POOR
CONDITION OF LID: ☒ GOOD ☐ FAIR ☐ POOR

FRAME OPENING DIMENSION: 20"

RUNGS INSTALLED: ☐ YES ☒ NO
RUNG CONDITION: ☐ GOOD ☐ FAIR ☐ POOR

OUTGOING LINE:

	SIZE	To M.H./C.B. # or Designation	Distance	Invert Depth
#1	4"	WEST (DROP PIPE)		2' 0"

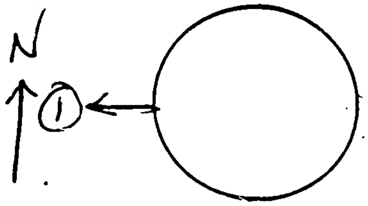
INCOMING LINE:

	SIZE	From M.H./C.B. # or Designation	Distance	Invert Depth
#2				
#3				
#4				
#5				
#6				

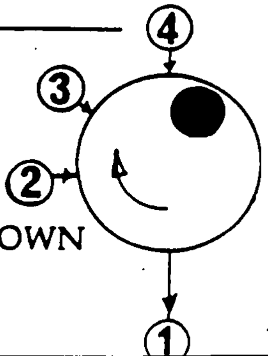
GENERAL CONDITION OF M.H./C.B.: ☐ GOOD ☒ FAIR ☐ POOR

COMMENTS: INVERT 2'3" ; CONCRETE STRUCTURE ; 25" WATER IN CATCH BASIN ;

SKETCH:



EXAMPLE: NUMBER INCOMING LINES AS SHOWN. DRAWN IN RELATIONSHIP TO OUTGOING LINE AS SHOWN IN DIAGRAM.



~~M.H.~~/C.B.# 18

TABLE 1

MANHOLE/CATCHBASIN INSPECTION LOG

CLIENT: LEICA INC.
LOCATION: CHEEKTOWAGA
DATE: 8/1/94

M.H./C.B. LOCATION: ROWAN RD AT PRESTON (NORTH TURNOFF)

☐ INSIDE FACILITY
☐ OUTSIDE FACILITY

TYPE OF FRAME: ☒ SQUARE ☐ CIRCULAR

TYPE OF LID: MISSING ☐ VENTED ☐ SOLID

MARKINGS ON LID: MISSING

CONDITION OF FRAME: ☒ GOOD ☐ FAIR ☐ POOR
CONDITION OF LID: GONE ☐ GOOD ☐ FAIR ☐ POOR

FRAME OPENING DIMENSION: 20"

RUNGS INSTALLED: ☐ YES ☒ NO
RUNG CONDITION: ☐ GOOD ☐ FAIR ☐ POOR

OUTGOING LINE:

	SIZE	To M.H./C.B. # or Designation	Distance	Invert Depth
#1	8"	SOUTHEAST		UNKNOWN

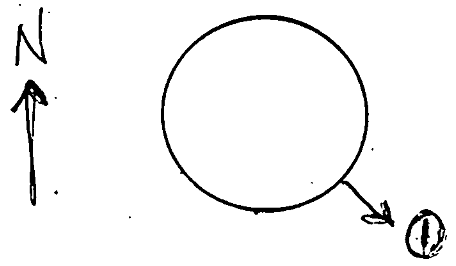
INCOMING LINE:

	SIZE	From M.H./C.B. # or Designation	Distance	Invert Depth
#2				
#3				
#4				
#5				
#6				

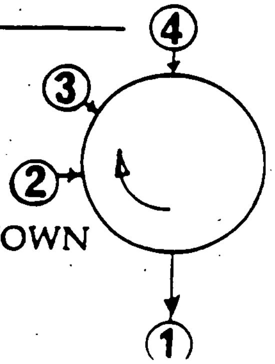
GENERAL CONDITION OF M.H./C.B.: ☒ GOOD ☐ FAIR ☐ POOR

COMMENTS: RECEIVER/CATCH BASIN ON WEST SIDE OF TURN-OFF ON NORTH SIDE OF ROWAN RD, OPPOSITE PRESTON RD.; NO COVER/GRATE; CHAIN LINK FENCING OVER RECEIVER; INVERT Unknown

SKETCH:



EXAMPLE: NUMBER INCOMING LINES AS SHOWN. DRAWN IN RELATIONSHIP TO OUTGOING LINE AS SHOWN IN DIAGRAM.



~~M~~H./C.B.# 19

TABLE 1

MANHOLE/CATCHBASIN INSPECTION LOG

CLIENT: LEICA INC.
LOCATION: CHEEKTOWAGA

DATE: 8/1/94

~~M~~H./C.B. LOCATION: ROWAN RD AT PRESTON (NORTH TURNOFF)

☐ INSIDE FACILITY
☒ OUTSIDE FACILITY

TYPE OF FRAME: ☒ SQUARE ☐ CIRCULAR

TYPE OF LID: MISSING ☐ VENTED ☐ SOLID

MARKINGS ON LID: MISSING

CONDITION OF FRAME: ☒ GOOD ☐ FAIR ☐ POOR
CONDITION OF LID: MISSING ☐ GOOD ☐ FAIR ☐ POOR

FRAME OPENING DIMENSION: 20"

RUNGS INSTALLED: ☐ YES ☒ NO
RUNG CONDITION: ☐ GOOD ☐ FAIR ☐ POOR

OUTGOING LINE:

	SIZE	To M.H./C.B. # or Designation	Distance	Invert Depth
#1	8"	SOUTHWEST		UNKNOWN

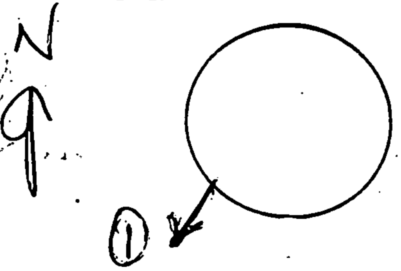
INCOMING LINE:

	SIZE	From M.H./C.B. # or Designation	Distance	Invert Depth
#2				
#3				
#4				
#5				
#6				

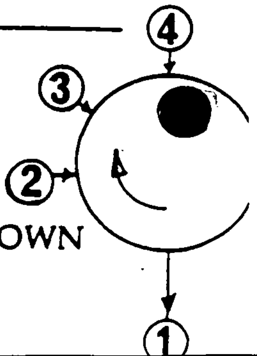
GENERAL CONDITION OF M.H./C.B.: ☒ GOOD ☐ FAIR ☐ POOR

COMMENTS: RECEIVER/CATCHBASIN ON EAST SIDE OF TURN-OFF ON NORTH SIDE OF ROWAN RD. OPPOSITE PRESTON RD.; NO COVER/GRATE; CHAIN LINK FENCE OVER RECEIVER; INVERT UNKNOWN.

SKETCH:



EXAMPLE: NUMBER INCOMING LINES AS SHOWN. DRAWN IN RELATIONSHIP TO OUTGOING LINE AS SHOWN IN DIAGRAM.



~~M.H.~~/C.B.# 20

TABLE 1

MANHOLE/CATCHBASIN INSPECTION LOG

CLIENT: LEICA INC,

LOCATION: CHEEKTOWAGA

DATE: 8/1/94

~~M.H.~~/C.B. LOCATION: ROWAN & CAROL RDS

☐ INSIDE FACILITY
☒ OUTSIDE FACILITY

TYPE OF FRAME: ☒ SQUARE ☐ CIRCULAR

TYPE OF LID: ☒ VENTED ☐ SOLID

MARKINGS ON LID: JAMESTOWN IRON WORKS, JAMESTOWN, N.Y.

CONDITION OF FRAME: ☒ GOOD ☐ FAIR ☐ POOR
CONDITION OF LID: ☒ GOOD ☐ FAIR ☐ POOR

FRAME OPENING DIMENSION: 26"

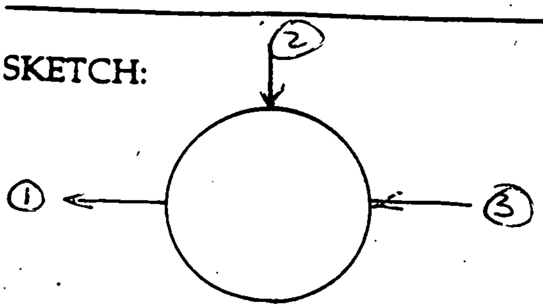
RUNGS INSTALLED: ☐ YES ☒ NO
RUNG CONDITION: ☐ GOOD ☐ FAIR ☐ POOR

OUTGOING LINE:	SIZE	To M.H./C.B. # or Designation	Distance	Invert Depth
#1	8" CMP	CB # 21		2' 11"
INCOMING LINE:	SIZE	From M.H./C.B. # or Designation	Distance	Invert Depth
#2	8" CMP	NORTH (CEMETARY)		2' 11"
#3	8" CMP	EAST (CEMETARY)		3' 0"
#4				
#5				
#6				

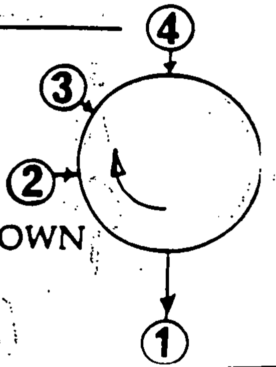
GENERAL CONDITION OF M.H./C.B.: ☒ GOOD ☐ FAIR ☐ POOR

COMMENTS: CONCRETE STRUCTURE; NORTH LINE LIKELY FROM ST. JOHNS CEMETARY BLDG.; EAST LINE SOURCE EITHER CAROL RD OR JEWISH CEMETARY.; INVERT 3' 6 1/2"

SKETCH:



EXAMPLE: NUMBER INCOMING LINES AS SHOWN. DRAWN IN RELATIONSHIP TO OUTGOING LINE AS SHOWN IN DIAGRAM.



~~M.H.~~/C.B.# 21

TABLE 1

MANHOLE/CATCHBASIN INSPECTION LOG

CLIENT: LEICA INC

LOCATION: CHEEKTOWAGA

DATE: 8/1/94

M.H./C.B. LOCATION: ROWAN RD. EAST OF PRESTON.

☐ INSIDE FACILITY
☒ OUTSIDE FACILITY

TYPE OF FRAME: ☒ SQUARE ☐ CIRCULAR

TYPE OF LID: ☒ VENTED ☐ SOLID

MARKINGS ON LID: JAMESTOWN IRON WORKS, JAMESTOWN, NY

CONDITION OF FRAME: ☒ GOOD ☐ FAIR ☐ POOR
CONDITION OF LID: ☒ GOOD ☐ FAIR ☐ POOR

FRAME OPENING DIMENSION: 26"

RUNGS INSTALLED: ☐ YES ☒ NO
RUNG CONDITION: ☐ GOOD ☐ FAIR ☐ POOR

OUTGOING LINE:

	SIZE	To M.H./C.B. # or Designation	Distance	Invert Depth
#1	8" CMP	CB # 21 A (SOUTH SIDE OF ROWAN)		2' 8"

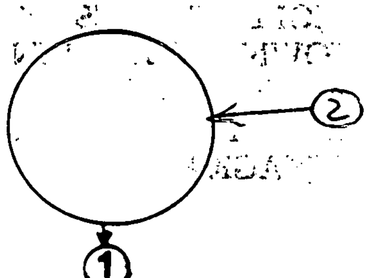
INCOMING LINE:

	SIZE	From M.H./C.B. # or Designation	Distance	Invert Depth
#2	8" CMP	CB # 20		2' 7"
#3				
#4				
#5				
#6				

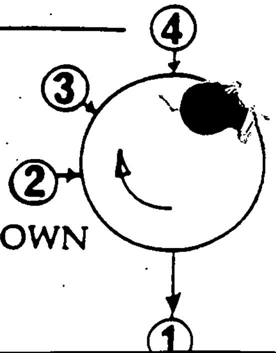
GENERAL CONDITION OF M.H./C.B.: ☒ GOOD ☐ FAIR ☐ POOR

COMMENTS: CONCRETE STRUCTURE ; Some Sediments.
INVERT 3' 3"

SKETCH:



EXAMPLE: NUMBER INCOMING LINES AS SHOWN. DRAWN IN RELATIONSHIP TO OUTGOING LINE AS SHOWN IN DIAGRAM.



~~M.H.~~/C.B.# 21 A

TABLE 1

MANHOLE/CATCHBASIN INSPECTION LOG

CLIENT: Leica Inc.
LOCATION: Cheektowaga

DATE: 8/1/94

~~M.H.~~/C.B. LOCATION: S. Side of Rowan East of Preston

☐ INSIDE FACILITY
☒ OUTSIDE FACILITY

TYPE OF FRAME: ☒ SQUARE ☐ CIRCULAR

TYPE OF LID: ☒ VENTED ☐ SOLID

MARKINGS ON LID: Jamestown Iron Works, Jamestown NY

CONDITION OF FRAME: ☒ GOOD ☐ FAIR ☐ POOR
CONDITION OF LID: ☒ GOOD ☐ FAIR ☐ POOR

FRAME OPENING DIMENSION: 26"

RUNGS INSTALLED: ☐ YES ☒ NO
RUNG CONDITION: ☐ GOOD ☐ FAIR ☐ POOR

OUTGOING LINE:

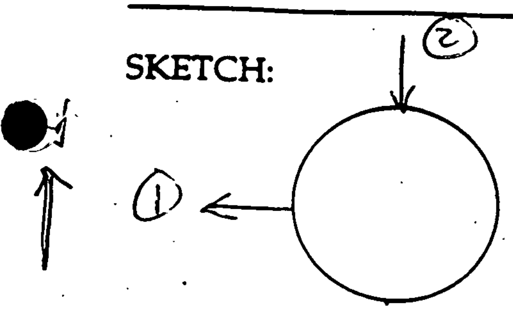
	SIZE	To M.H./C.B. # or Designation	Distance	Invert Depth
#1	8" CMP	WEST		3' 11"

INCOMING LINE:

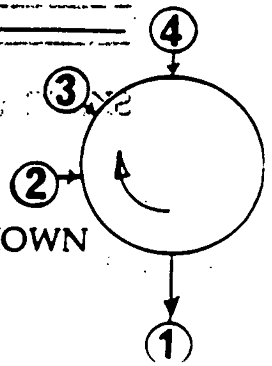
	SIZE	From M.H./C.B. # or Designation	Distance	Invert Depth
#2	8" CMP	CB # 21		3' 11"
#3				
#4				
#5				
#6				

GENERAL CONDITION OF M.H./C.B.: ☒ GOOD ☐ FAIR ☐ POOR
COMMENTS: Concrete structure; Invert IN 3' 6"

SKETCH:



EXAMPLE: NUMBER INCOMING LINES AS SHOWN. DRAWN IN RELATIONSHIP TO OUTGOING LINE AS SHOWN IN DIAGRAM.



~~MH~~/C.B.# 24

TABLE 1

MANHOLE/CATCHBASIN INSPECTION LOG

CLIENT: Leica Inc
LOCATION: CHEEKTOWAGA

DATE: 8/1/94

~~MH~~/C.B. LOCATION: E. PARKING LOT E. OF GUARD HOUSE

☐ INSIDE FACILITY
☒ OUTSIDE FACILITY

TYPE OF FRAME: ☒ SQUARE ☐ CIRCULAR

TYPE OF LID: ☒ VENTED ☐ SOLID

MARKINGS ON LID: —

CONDITION OF FRAME: ☒ GOOD ☐ FAIR ☐ POOR
CONDITION OF LID: ☒ GOOD ☐ FAIR ☐ POOR

FRAME OPENING DIMENSION: 26"

RUNGS INSTALLED: ☐ YES ☒ NO
RUNG CONDITION: ☐ GOOD ☐ FAIR ☐ POOR

OUTGOING LINE:

	SIZE	To M.H./C.B. # or Designation	Distance	Invert Depth
#1	4"	SOUTH (MH ST-H?)		1'5"

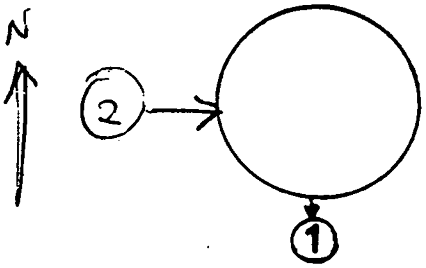
INCOMING LINE:

	SIZE	From M.H./C.B. # or Designation	Distance	Invert Depth
#2	4" CMP	WEST		1'8"
#3				
#4				
#5				
#6				

GENERAL CONDITION OF M.H./C.B.: ☒ GOOD ☐ FAIR ☐ POOR

COMMENTS: Concrete Structure ; INVERT 1'8"

SKETCH:



EXAMPLE: NUMBER INCOMING LINES AS SHOWN. DRAWN IN RELATIONSHIP TO OUTGOING LINE AS SHOWN IN DIAGRAM.